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Economics Statistics Cooperatives

Program Results and Plans

December 1979

United States
Department
of Agriculture

Economics, Statistics,
and Cooperatives Service
ESCS-76

ECONOMICS, STATISTICS, COOPERATIVES: Program Results and Plans. Economics, Statistics, and Cooperatives Service, U.S. Department of Agriculture. ESCS-76.

Preface

The Economics, Statistics, and Cooperatives Service (ESCS) has three major missions within the U.S. Department of Agriculture: develop economic and statistical research, analysis, and information related to national and international food and agriculture, natural resources, and rural communities; collect and publish statistics related to agriculture, natural resources, and rural communities; and formulate research and technical assistance on financial, organizational, management, legal, social, and economic aspects of cooperatives. This report focuses on accomplishments in 1979 and outlines some priority areas for 1980 and beyond.

Editor's Note

The charts appearing in this report are samples from the 1979 Handbook of Agricultural Charts (Agriculture Handbook No. 561) published by ESCS. For a single free copy, write ESCS Publications, Room 0054-South, U.S. Department of Agriculture, Washington, D.C. 20250, or phone (202) 447-7255.

Washington, D.C. 20250

December 1979

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Foreword

The Economics, Statistics, and Cooperatives Service is probably the largest single producer of economic and statistical information in the world and thereby a major component of the U.S. and world agriculture and rural information system. It is directed toward providing economic information relevant to food, agriculture, resources, and rural America. It provides statistical data on the performance and economic well-being of these sectors, and interprets what the data mean for use by and for the benefit of farmers, business, rural people, consumers, and public policy officials.

Domestic agriculture and rural America have changed dramatically in recent years; even more significant changes are predicted. This dynamism demands that research establishments such as ESCS provide useful, timely information vital for public and private decisionmaking.

The information needs of the next decade will be heavily influenced by issues related to energy, inflation, and resource shortages. New dimensions are being created by the increasingly important interdependencies between rural and urban areas, between agriculture and the rest of the economy, and between the United States and the world. These will place exceptional and new demands on our data and require new or expanded economic research.

The main purpose of this report is to provide examples of work which this agency accomplished in 1979. But it also looks to the future. It reviews some of the important new work that is underway or planned for 1980, and it suggests some important areas of work that must be started in the 1981-83 period if the needs of the next decade are to be met.

We have developed our priorities after advice and counsel from many in and beyond the Department. We have met with leaders of the economics profession, statistics users, farm organizations, congressional staffs, consumers, and other client groups. We also met with the Department's assistant secretaries and most agency heads. In addition, we have benefited from our participation in the Joint Council, the National Association of State Universities and Land-Grant Colleges, the Federal Economic Statistics Coordinating Committee, and others.

We greatly appreciate the counsel of these individuals and groups, and invite their continued cooperation as we develop our programs to meet the needs of agriculture, rural communities, and consumers.

Kenneth R Farrell

KENNETH R. FARRELL
Administrator

Economics, Statistics, Cooperatives: Program Results and Plans

Introduction

The Economics, Statistics, and Cooperatives Service (ESCS) was established in January 1978 by consolidation of the Economic Research Service, the Statistical Reporting Service, the Farmer Cooperative Service, and the Economic Management Support Center. The basic functions of the agencies were retained and are now coordinated within the following missions.

1. Economic analysis and research.--This includes monitoring economic activities in agriculture and rural communities and developing short-term forecasts and long-range projections of resource needs, production, and distribution of food and fiber. It includes measuring the performance of the food and fiber sector in meeting the needs of domestic and foreign consumers and in meeting other national goals concerning such matters as resource ownership and use, income and its distribution, and the structure and organization of agriculture and the food system. Current information is also developed on the principal social and economic factors affecting the quality of life in farm and rural areas and the impact of alternative public and private actions on them.

2. Crop and livestock estimates.--This provides basic data on production, prices, and other aspects of agriculture through enumerative and objective measurement surveys. These estimates become the official national and State estimates and reports of the U.S. Department of Agriculture (USDA) relating to acreages, types and production of farm crops, number of livestock on farms, livestock production, stocks of agricultural commodities, value and utilization of farm products, and prices received and paid by farmers. The function also includes review, clearance, coordination, and improvement of statistics in the Department, and research and development of statistical techniques to improve the efficiency of gathering, evaluating, and processing statistical data.

3. Research and technical assistance for agricultural cooperatives.--ESCS serves as the national focal point for information about farmer cooperatives. This includes studies on financial, organizational, legal, social, and economic aspects of cooperatives that market farm products, purchase production supplies, and perform related business services. Technical assistance supported by these studies is given on organizing new cooperatives, improving cooperative performance, changing business structure, and developing strategies for growth.

ESCS has a mandate to serve the unique economic information and analysis needs of the Federal Government. The agency, however, is a part of a much larger agricultural research community with which it shares a responsibility to ensure that programs are coordinated and conducted cooperatively. ESCS is probably the largest agricultural economics research institution in the world, but the land-grant and other cooperating universities together outnumber the agency in terms of scientist-years devoted to economic research. ESCS accounts for about 40 percent of the 1,100 scientist-years, compared with 50 percent for State institutions.

The agency has historically worked closely with the departments of agricultural economics in land-grant universities in a variety of partnership arrangements. This includes participating in joint ventures in which various institutions contribute people and money and with the work carried out as a team, and contracting with universities to conduct research projects where it was clear those institutions have a comparative advantage. University faculty members have served tours at ESCS headquarters in Washington, D.C., and agency economists have been assigned to work at land-grant universities.

A large part of the crop and livestock estimates program is carried out through 44 State statistical offices serving the 50 States. Most offices are operated as joint State and Federal services through cooperative arrangements with State agencies. Economic analysis and research projects are done in Washington, D.C. and with small staffs in 35 States, principally at the land-grant colleges and universities.

The agency received an appropriation from Congress for fiscal year 1980 of about $86 million. This represented an increase of $3.6 million over fiscal year 1979 for program related activities and a net of $2.4 million to cover higher costs for salaries, rents, postage, and other uncontrollable items. The fiscal year 1980 appropriation represents an increase of almost 80 percent from 1973. However, inflation has taken its toll--in real terms there has been no effective increase in funding, and total personnel has stayed about the same.

	1973	1976	1979	1980
	Million dollars			
Appropriations	48	63	80	86
Transfers, etc.	6	7	8	7
Total actual funds	54	70	88	93
Total in 1973 dollars	54	53	53	54
	Full-time positions			
Employment	2,251	2,287	2,193	2,237

Almost one-quarter of the appropriated funds are spent for a large variety of program related contracts and agreements. These include:

--$2.9 million for various kinds of arrangements with universities for research,

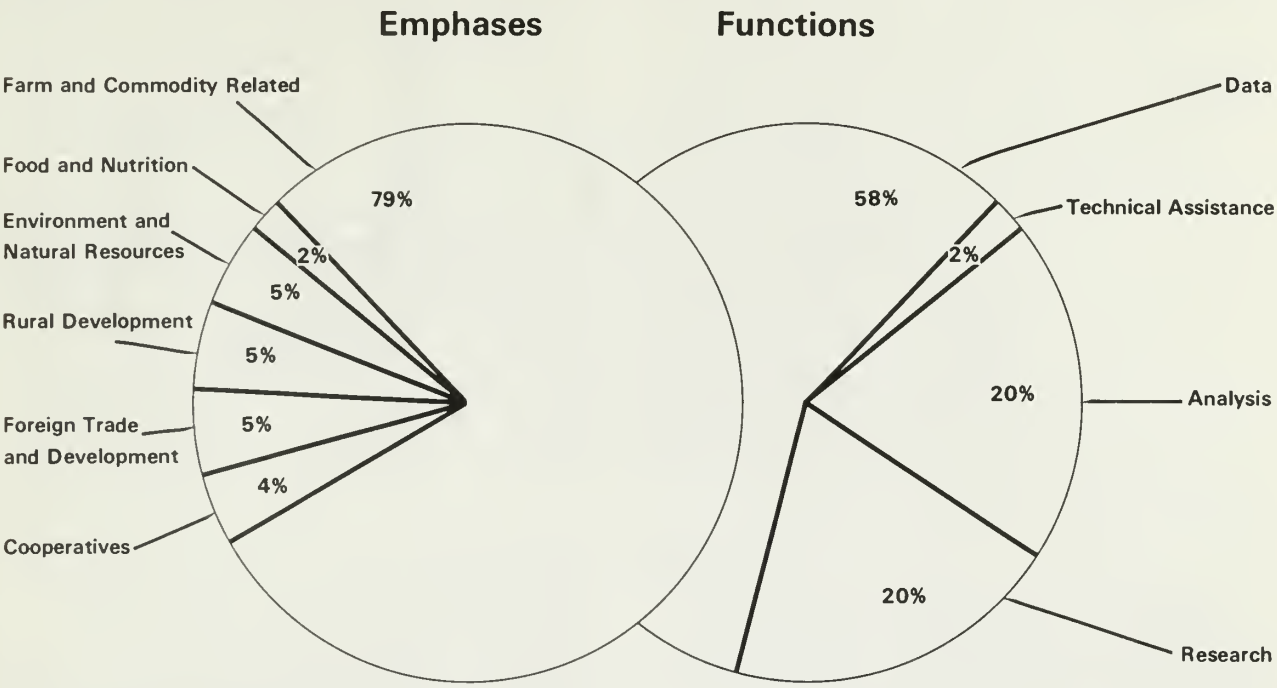
--$3.6 million for INFONET, a national computer network that permits access to ESCS data in many States, and

--$9.3 million for hiring mostly part-time enumerators for statistical surveys.

More than three-fourths of ESCS' activities are related to providing information about farms: inputs, production, and marketing (see chart). Much of this concerns the collection of crop and livestock statistics that are basic to research and analysis of the agricultural situation and outlook. The remaining one-fourth is divided among rural development, foreign trade, natural resources, cooperatives, and food and nutrition, with most of the activity for research and analysis.

The ESCS program is continually being changed through congressional actions and internal redirection to meet the challenge of the times. The current year's program is vastly different from that of 10 or 15 years ago when emphasis was placed on information about individual farms and businesses. Today, the emphasis is placed on information for public policy decisions. But even in comparison to last year, the program reflects a change of nearly $6

ESCS Emphases and Functions



million. The major program changes that underlie the 1980 program are:

--reductions in day-to-day reporting of market intelligence (assumed by the World Outlook and Situation Board),

--reductions in some cost of production and price spread data and frequency of reporting for some minor products,

--reductions in research related to sludge disposal and State water laws,

--reduction and termination of statistics for minor commodities, mainly vegetables and honey,

--increases in research on the supply and demand for commodities and commodity programs,

--increases in research in water quality, rural credit, and farm financing,

--increases in analysis of food safety, quality, and nutrition,

--increases in data and research on small farms,

--increases for the improvement and coverage of price statistics for crops and livestock,

--shifts within the Cooperative program to allow for increased emphasis on cooperative development, and

--increases for continuing work on remote sensing.

Information and data developed by ESCS on food, agriculture, natural resources, and rural development are made widely available. They are used by farmers, processors, handlers, consumers, and others to make production, marketing, and purchasing decisions, and by legislators and other public officials to develop and administer agricultural, consumer, and rural programs.

Program Results for 1979

ESCS research conducted during the past year can be classified into 10 categories: supply, demand, and price; structure and performance; food and nutrition; agricultural and food policy; foreign demand, supply, trade, and development; natural resources; environmental quality; rural development; assistance for cooperatives; and crop and livestock estimates. This section focuses on the objectives in these areas and examples of some of the work that was accomplished.

Supply, Demand, and Price

Economic research and analysis are conducted to provide fully reliable estimates and forecasts of supply, demand, and price for major farm commodities and production inputs. The work focuses on national forecasts and analyses of production, consumption, demand, costs, and prices for food grains, feeds, fibers, oils, fruits, vegetables, sweeteners, tobacco, meat animals, dairy, and poultry. Inputs include credit, finance, fertilizers, pesticides, transportation services, and energy. The following are among the more significant results related to outlook and costs.

Pesticide Supplies and Demand

Pesticide supplies for the 1979 crop season appeared adequate for all major uses. Production was up about 2 percent and inventories were up about 4 percent. Net supplies were about 5 percent greater overall than last year. Increased production and distribution costs advanced prices an estimated 2 to 3 percent over 1978.

Hog Production Costs

Farrow-to-finish hog production enterprises provide 75 to 80 percent of the total supply of hogs for slaughter; feeder pig finishing provides all of the remainder. The average total cost of producing pork, including culls, was $47.67 per hundredweight in 1977. Receipts averaged $39.92 per hundredweight, which failed to cover total costs by $7.75. The situation was slightly better in 1978; costs were $49.92 per hundredweight and receipts were $47.60 per hundredweight, for a loss of only $1.82. There was a third year of losses in 1979; costs were $51.75 per hundredweight and returns were $48.41, for a loss of $3.34.

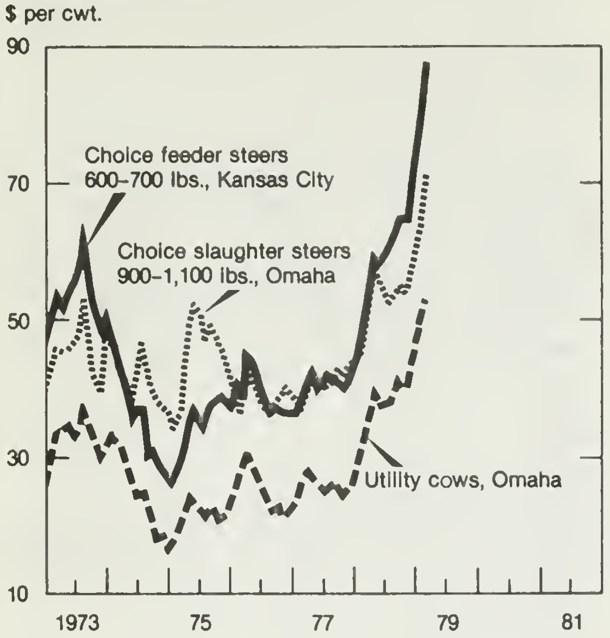
Feeder Cattle Production Costs

Production costs for U.S. cow-calf enterprises increased from an average $65.64 per hundredweight of calves and yearlings sold in 1977 to $66.56 per hundredweight in 1978 and to $71.39 in 1979. Sales in 1977 fell $15.16 per hundredweight short of covering costs, but increased enough to provide returns of $13.10 per hundredweight in 1978 and $32.45 per hundredweight in 1979.

Fed Cattle Production Costs

Average costs of producing fed cattle in 1977 were $43.16 per hundredweight, while receipts averaged only $40.18 per hundredweight, for a loss of $2.98. Costs in 1978 increased to $47.58 per hundredweight, but receipts increased to $52.50 for average net returns of $4.92.

Cattle Prices



Costs for 1979 are estimated at $64.36 per hundredweight, with most of the increase due to much higher feeder cattle prices. The increase in fed cattle prices is not expected to be as great as the increase in feeder cattle prices, so net returns will average only an estimated 94 cents in 1979.

Milk Production Costs

It cost an average of $9.53 to produce a hundredweight of milk in 1978 after allowing for returns from cull cow and calf sales. Costs are expected to rise to $10.53 in 1979. Average prices received for milk of $10.49 in 1978 and $12.10 in 1979 brought producers a positive net return to labor, management, and risk. When measured in constant dollars, milk producers' returns have increased more than has inflation since 1977.

Crop Production Costs

Farmers' per acre costs to produce 10 major U.S. crops increased an average of 6.2 percent in 1978 and over 8 percent in 1979. Barley registered the largest increase in 1978 at 10 percent, while cotton costs decreased just over 1 percent. Rising machinery and fuel costs were the major causes of the 1978 production-cost increases. The decrease in cotton costs is attributed both to a decrease in chemical and fertilizer applications and to reduced ginning costs resulting from reduced yields. Increases in 1979 ranged from 6.6 percent for rice to 9.3 percent for flaxseed; costs for wheat, corn, barley, oats, sorghum, soybeans, peanuts, and cotton rose 8 percent or more.

Supply, Demand, and Prices of Rice

A model was developed to estimate the interrelationships of economic and institutional factors that affect supply, demand, and prices for U.S. rice. Rice yields were found to be affected by climatic conditions, technological changes, area in rice, and other factors. Lagged farm price did not appear to influence rice yields during 1950-76. Production response to a price change (elasticity) varies from 0.25 in Texas and Mississippi to nearly 0.5 in Arkansas. Income and population are the major variables affecting food rice consumption. Changes in retail price have a very minor impact on demand. Government exports are more elastic with respect to prices than are commercial exports. The degree of substitution of Government exports for commercial export sales is relatively low.

Costs and Returns for Rice

The cost of rice production in the United States increased appreciably in most of the major rice-growing areas between 1975 and 1978. Except for planting seed and fertilizer, for which prices were unusually high in 1975, all other direct input items were much more expensive in 1977. Cost increases eased in 1978, but only to a level comparable with overall inflation. Ownership costs of farm equipment for established growers increased only moderately since 1975, as new machines were substituted for fully depreciated items.

Rice Production in Nontraditional Areas

The production potential for new areas of rice is limited. About 340,000 acres of land in the Florida Everglades, Louisiana river parishes, and Puerto Rico are well suited for rice production. If the areas were fully developed, approximately 200,000 acres could produce a crop annually, with 30,000 to 40,000 acres in Puerto Rico producing two crops. However, the acreage most likely to be developed will depend on farm prices. It ranges between 90,000 and 160,000 acres, with crops of 5 to 9 million hundredweight of rice. The impact of this production on supplies of and prices received for U.S. rice would be comparatively minor.

U.S. Cropland Rental Practices

There has been some concern about the large amount of farmland that is rented. However, a recent survey indicates that the pattern for farm lease contracts between tenants and landlords follows traditional land rental arrangements. However, there is more evidence of lease negotiations. Contracts range from almost purely crop-sharing leases in the western wheat/summer fallow regions to almost purely cash leases in the New York and Pennsylvania dairy regions. The most common agreement on share-rented acreage and the most common rental on cash-rented acreage are summarized for 35 States.

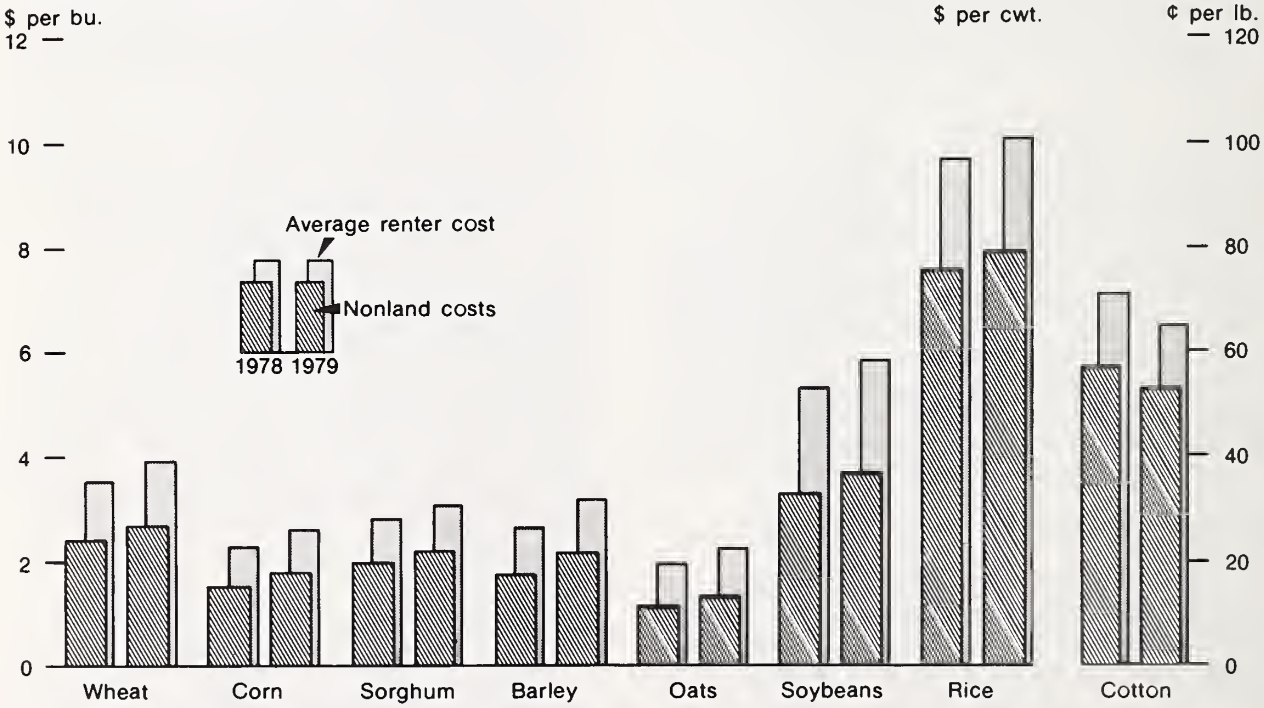
Grade B Milk Market

The rapid conversion by U.S. dairy farmers from Grade B to Grade A milk production could eliminate Grade B milk for manufacturing as the basis for all U.S. milk prices. Classified pricing and pooling policies under Federal milk marketing orders could be direct factors causing this conversion. A policy to lower Class I price differentials in Federal orders while increasing Grade B support prices could maintain a viable manufacturing milk market and thereby maintain the Minnesota-Wisconsin Grade B price as a viable basis for determining all Class I prices. This policy could be followed under existing orders, probably without creating disorderly marketing conditions.

Automation of Dairy Subsector Data

Automation of a dairy data bank was completed to facilitate situation and

Crop Production Costs



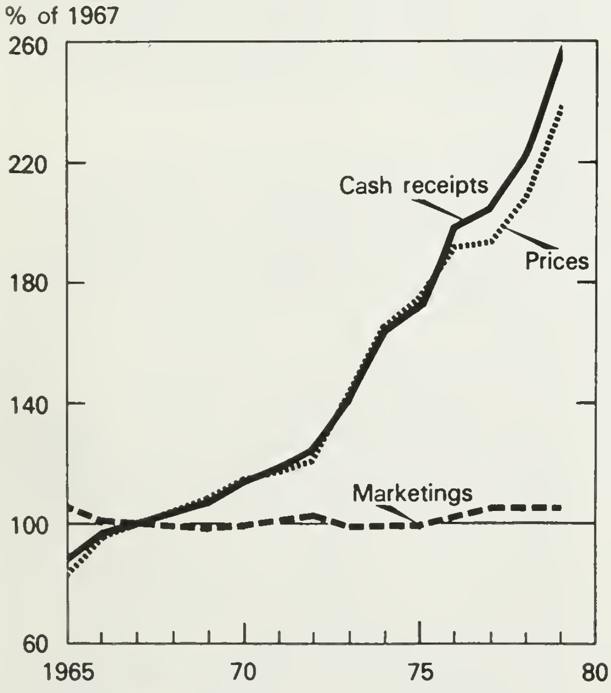
Value of wheat pasture subtracted from production costs (1978-1979, 6 cents/bushel).
Value of cotton seed subtracted from production costs (1978, 7.4 cents/pound of lint, 1979, 10.0 cents/pound).
1978 preliminary 1979 projected.

outlook analysis for the dairy industry and to meet heavy demands for dairy subsector data. The dairy data bank consists of approximately 900 time series and cross sectional variables with monthly data from 1955 to date. An interactive computer procedure was developed to permit users to create new variables and to change the descriptive documentation for existing variables. The stored historical and current data are generally public information and are available to all users upon request. A simple card program indicating desired data can provide overnight turnaround for hard copy.

U.S. Wine Market

The typical wine purchasing household, according to a survey of 7,000 households, has higher income, fewer members, and more education than average. About half of U.S. households never buy wine, and less than 5 percent purchase more than half the wine. Wine prices and income influence the amount of wine purchased. Industry revenues would increase in some markets if prices were raised.

Milk Marketings, Prices, and Cash Receipts



1979 forecast.

Conversion Factors, Weights, and Measures

ESCS staff members compiled a manual of uniform conversion factors for agricultural commodities and their products for use in statistical, research, and service programs of USDA. Data in most cases represent overall averages, but a few represent only rough approximations. All, however, are based on the most recent available information and are intended to reflect current conditions and practices.

Price Behavior in Thin Markets

The gradual disappearance of open markets for some commodities continues to be of concern. The effects on price behavior of a declining volume of trading on a central market were investigated, using the Denver cattle market from 1955 to 1968 as a case study. The usual measures of dispersion--standard deviations and coefficients of variation--showed little effect of market volume on price behavior, but pricing did seem to be influenced by declining volume when examined in terms of correlation and regression measures.

Automated Weather-Yield System

An automated system of forecasting models for crop yields was developed and documented. A major component of the system is a data bank containing weekly weather information and appropriate economic variables. The yields of corn, soybeans, sorghum, barley, oats, and wheat can now be forecast with greater facility and reliability.

Cross-Commodity Policy Model

The scope of the agency cross-commodity annual econometric model was expanded with the addition of a farm income and expense component. Both supply and demand equations in the livestock sectors were reestimated to better forecast both price and quantity. The export sector of the crops model incorporated recent foreign price-transmission elasticities. Wheat, barley, and oats demand models were respecified and reestimated with the new June-May crop-year data.

Wheat Prices and Welfare

The effects of alternative combinations of wheat support prices and release prices on producers' and consumers' welfare during 1979-80 were analyzed using a simulation model. The sensitivity of the estimates to alternative assumptions about producers' response to risk and the discount rate for private storers were evaluated. The results show that the primary welfare gains from Government storage arise through the shift in the supply function associated with the reduced variability of producers' returns.

Wheat Feed Use

Food use of wheat is fairly stable from year to year, but livestock feed use varies widely. An econometric model was developed to provide more accurate forecasts of annual wheat feeding. Model results indicate that the level of wheat feeding is related to feed grain and wheat prices, cattle prices, and the number of cattle on feed. These factors account for a high percentage of the annual variation in wheat feed use.

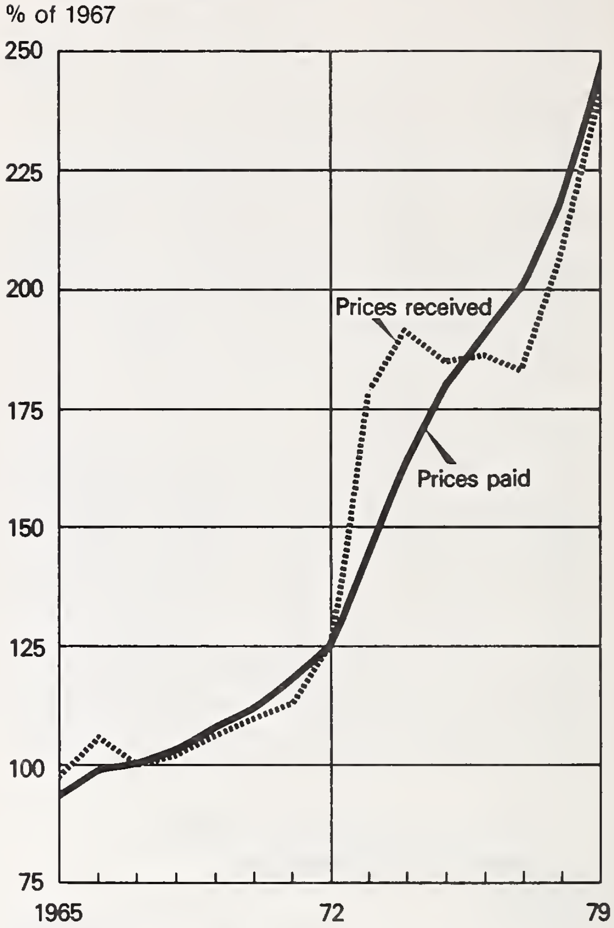
Monthly Livestock Forecasting

Unprecedented volatility in the livestock market in recent years has increased Government and private demand for more short-term market outlook information. To meet these demands, some of the critical factors affecting livestock and broiler markets are being focused upon on a monthly basis. These include slaughter, production, consumption, retail prices, wholesale prices, and farm prices, which can be projected 18 months.

Livestock Roughage Consumption

The goals programming concept was used to estimate livestock roughage consumption by type of roughage and State. The concept involves multiple conflicting objectives or goals which are evaluated subject to goal and nongoal constraints. The goal programming algorithm develops a solution to a multiple objective problem by minimizing the nonattainment of all goals subject to the restrictions imposed by nongoal constraints. Data for Wisconsin are used to illustrate how the model is set up and run. Input data requirements for applying the model to each of the 48 contiguous States are described.

Prices Received and Paid By Farmers



Prices paid includes commodities and services, interest, taxes, and wage rates. 1977 forecasted.

Farmers' Newsletter and Newsline

Farmers' newsletters, conceived in fiscal year 1978 to aid farmers in making production and marketing plans, showed substantial growth in demand in fiscal year 1979. Six titles in the series (wheat, feed, soybeans, livestock, cotton, and general) are mailed to farmers upon their request at no charge to them. The total mailing list reached 170,000 names by midsummer, about double the total of a year earlier. Letter volume, estimated at

2.9 million pieces in fiscal year 1979, is projected to grow to 3.3 million in fiscal year 1980.

A related project, Farmers' Newsline, is a toll-free daily call-in service for farmers wanting the latest crop and livestock information in the form of a recorded minute-long message. Farmers' Newsline, in operation for less than 2 years, has exceeded 1 million calls, and average volume now runs about 2,500 calls per day.

Outlook and Situation

Separate outlook and situation reports are published regularly covering eight commodity groups, major agricultural inputs, and the national food situation. These reports assess the current situation and the short-term prospects for demand, supply, and prices.

Mississippi Market News

Effects of a new Agricultural Marketing Service (AMS) Market News report on prices of feeder cattle and cows in Mississippi auction markets were analyzed. The analysis revealed a significant increase in the ability of the reported price to predict the price in the forthcoming time period. This suggested that the new Market News report helped to increase the efficiency of Mississippi auction markets.

Soybean Oil

More than 8 million metric tons of fats and oils are utilized in the United States annually, with about two-thirds used in food products and the rest in industrial products. Soybean oil contributes 3.6 million metric tons to the total, with about 94 percent going to food uses. Soybean oil, an ingredient in most edible fat products, accounts for over 20 percent of the world's fats and oils, with the United States producing 60 percent.

Sunflowers

Sunflowers are becoming a more important crop in the United States and the world. The increase is expected to continue in the future because of the high yield potential and superior agronomic characteristics of hybrid oilseed sunflowers, the need for alternative crops in some areas, the existence of excessive crushing capacity in areas where flax and cotton were once important, increasing world demand for edible fats and oils, and the health benefits of polyunsaturated oils. Future expansion of sunflowers in the United States is likely to occur on land located on the fringe of corn, soybean, and cotton growing areas.

Structure and Performance

Work in this area seeks to help public and private officials make better decisions through improved information on farm programs, regulations, and other policies directed at improving the economic performance of the food and fiber system. It also measures the economic position of farmers, the efficiency and adequacy of the distribution system, and the impacts of the various factors that cause changes in production and marketing. Some examples of this work follow.

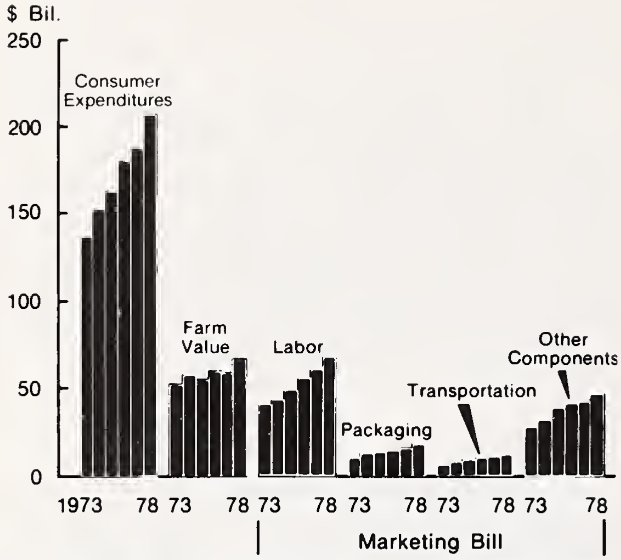
Status of the Family Farm

The structure of the U.S. farm sector is changing. Farm production and sales are becoming more concentrated; 125,000 farms accounted for half of all farm sales in 1974, which required 205,000 farms a decade before. The average age of farm operators steadily increased from 48.7 years in 1945 to 51.7 years in 1974, as fewer younger farmers entered farming than older operators retired or sold out. Changes in the relationship between the farm and marketing sectors have forced more farmers to consider forward contracting and farmer-to-consumer direct marketing. And most of the $2 billion disbursed through the 1978 farm programs went to the larger farms.

Energy and Food Processing

A methodology was developed to estimate fuel consumption not reported by

Where Consumer Expenditures for Farm Foods Go



Other components include business taxes, corporate profits, energy, depreciation, rent, advertising and numerous other costs.
1978 preliminary

census, using data from the 1975 Annual Survey of Manufacturers and the 1972 Census of Manufacturers. With this, complete accounting can be made of major energy use in the food processing industry at the State, four-digit Standard Industrial Classification level.

Agricultural Productivity

The growth rate for U.S. agricultural productivity through the year 2000 may equal the historical rate if research and extension (R&E) investment increases and unprecedented technologies develop. The level of public expenditures in agricultural R&E is the single most important policy variable in determining growth rates. The most promising new technologies are photosynthesis enhancement (formation of plant carbohydrates through exposure to light), bioregulators (compounds which promote ripening or prolong shelf like) in crop production, and twinning in beef cattle production.

Landmarks in Agriculture

A chronology of major events in the history of U.S. agriculture was developed that includes key inventions, laws, changes in land policies, individual contributions, the development of institutions, and the introduction of new types of crops and livestock. There are also notes on all commissioners, secretaries of agriculture, and agencies established in response to new programs in the U.S. Department of Agriculture.

Marketing Spreads for Food Products

Food prices in 1979 will average about 11 percent higher than in 1978. Half the increase is due to wider farm-to-retail price spreads. Retail food prices were 10 percent higher in 1978 than in 1977. The largest 1979 increases were for red meat and fresh fruits and vegetables, up 17 and 14 percent, respectively. Higher farm values for food commodities, up 12-percent, accounted for two-fifths of the increase in grocery store and food prices in 1978. The spread between farm and retail prices was 12 percent and accounted for about half of the food-price increase. Higher prices for fish and imported foods accounted for 10 percent of the increase.

Balance Sheet of the Farm Sector

Farm assets were valued at $820 billion January 1, 1979, and outstanding debt was $137 billion, leaving farm proprietors an equity of $683 billion. Each of these amounts stood about 15 percent above their value on January 1, 1978. Farm real estate was valued at $600 billion, up $74 billion. The value of other farm physical assets rose $31 billion, and financial assets were up $2 billion. Farm real estate debt outstanding was $72 billion, and nonreal estate debt (excluding Commodity Credit Corporation--CCC--loans) was $60 billion. CCC loans totaled $5.2 billion, a record high.

Gasohol

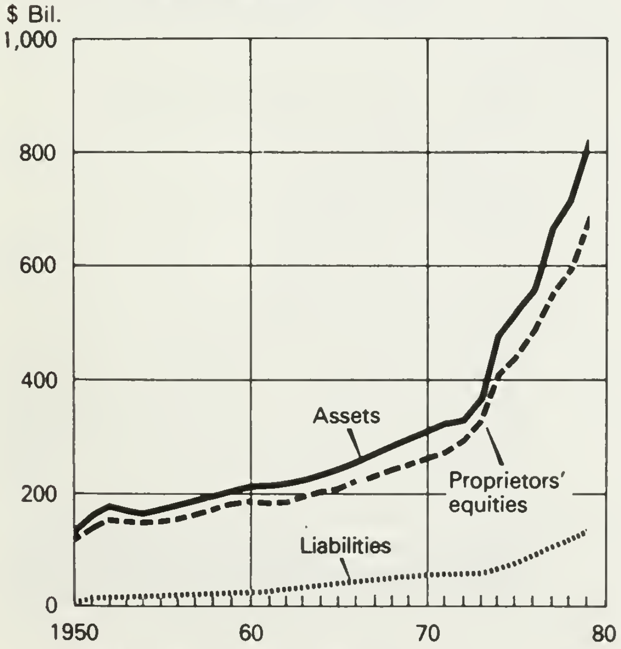
The production of 25 billion gallons of gasohol would reduce oil imports by $600 million, increase final demand $1.6 billion, and generate an increase in total domestic gross output of $5.9 billion in 1967 dollars. The consumption of gasohol rather than gasoline would generate a net 71-cent increase in U.S. economic activity for each dollar consumed as gasohol.

U.S. Wheat Industry

U.S. wheat production doubled between 1950 and 1975. Improved yields per acre accounted for most of the increase. Since 1974, however, the growth in U.S. wheat yields per acre has leveled off. About half of the U.S. wheat crop is exported, but the somewhat erratic nature of foreign demand has caused considerable instability in the industry. Large carryovers have been a problem in most years since 1950, despite Government programs to regulate acreage, subsidize producers, carry stocks, and facilitate exports.

Reclaiming Cotton Gin Wastes

Gin wastes are an important source of fiber in some cases. A survey indicated, however, that only 32 percent of all active U.S. cotton gins reclaimed and sold cotton gin motes (wastes) during marketing year 1976/77. The collection ranged from 7 percent of active gins in Missouri to 95 percent in California. Total U.S. supply of motes was estimated at 93 million pounds. Ginners received an average of 12.8 cents per pound for cleaned motes and 7.4 cents per pound for uncleaned motes, but the price varied widely by region and type of buyer.



U.S. Farm Balance Sheet

Data as of January 1. Data for 50 States beginning with 1960.

Model of Cotton Economy

A detailed interindustry input-output model, emphasizing each major sector of the U.S. cotton industry, was developed that incorporates regional cotton production, ginning, warehousing, and merchandising with the latest U.S. Department of Commerce 484-sector interindustry table. The interaction between these regional cotton sectors and the textile processing and apparel industries is also provided. The model will be used to assess the aggregate economic impacts of changes in cotton production levels and resource use on other sectors of the economy. In particular, it will help measure the effects of proposed national policies and programs on the cotton system, including the costs and benefits of USDA's boll weevil eradication program and the impacts of alternative cotton dust control technologies.

Cotton Ginning Model

A computerized model for estimating cotton ginning costs over a wide range of assumptions was developed that is based on economic-engineering techniques. The model provides a tool for both policy analysis and for providing management information to the industry. It is being widely used by extension ginning specialists (especially in west Texas) to provide answers to specific management questions such as the impact of merging two or more gins and the cost of erecting new ginning complexes.

Early Maturing Cotton

Minilinear programming models were developed and used to measure the economic impact of selected technological changes in the production sector. One of these changes was the use of new earlier maturing cottons in the Mississippi Delta which have yielded as well as, and in some cases better than, current varieties. Production costs are lower for these varieties due to slight reductions in insect control costs and a longer harvest season which spreads the use of cottonpickers.

Cotton Gin Operating Costs

Cotton gin operating costs averaged $27.90 per bale in the Midsouth for the 1977/78 season, up $5.46 per bale from 4 years earlier. Average utilization of capacity was 54 percent, compared with 58 percent in the earlier period, but rated hourly capacity of gins increased about 6 percent due to installation of larger equipment and some higher capacity gin stands. Energy and labor costs accounted for a major part of the increase in ginning costs.

Rice Distribution Patterns

A survey of U.S. rice marketing between 1956 and 1975 indicates that brewers and breakfast cereal manufacturers became increasingly important outlets in the domestic market. Exports, however, overtook domestic use and increased their share of total disappearance from 43 to 66 percent. During 1961-75, exports more than quadrupled, domestic direct food use increased about 60 percent, processed food use about doubled, and rice use in beer doubled.

Corn Sweetener

Fructose production has competed marginally with the production of cane and beet sugar in recent years. Purdue University, under contract with ESCS and using an economic-engineering model, estimated that production costs for high fructose corn sirup ranged from 7.7 to 10.6 cents per pound, dry weight basis, for crop year 1977/78. The model can provide cost of production information for plant capacities of 36,000, 72,000, and 108,000 bushels per day. The model can be used to estimate industry production costs and economies of size in the industry and test the sensitivity of high fructose corn sirup production costs of changes in selected input and output cost factors.

Baled Burley Tobacco

An evaluation was made of the allowance that 5 percent of the 1978 burley tobacco crop quota could be sold in bales. It was found that large growers could save 7 cents per pound by baling tobacco, but small growers with few alternative opportunities for their labor would save less. Buyers differed considerably in their views about baled tobacco. Cigarette manufacturers generally were more receptive than dealers; the dealers were concerned that the United States might lose burley exports because of the higher risk of deterioration in quality and condition of baled tobacco. All buyers agreed that the cost of handling and processing baled tobacco was higher than traditional means, but some indicated that a complete switch to bales would ultimately result in cost savings.

Dairy Manufacturing Plants

Equipment and operating schedules of 169 large dairy manufacturing plants show adequate capacity to handle seasonally high levels of milk production. Plants in the Northeast generally operate less intensively than plants in the North Central or Western areas. Larger plants and cheese plants generally have newer equipment and operate closer to capacity.

Meat Marketing Channel Survey

A marketing channel study for beef and pork from packer to consumer was initiated to accurately determine the types of firms and their relative importance in moving meat to the consumer. Marketing channel surveys will show the proportions of beef and pork consumers purchase through retail stores, full service restaurants, fast food outlets, institutions, and other sources. Data from a large study of five metropolitan areas in the South surveyed during fiscal year 1979 will provide a broader base than the initial St. Louis pilot study. Data from St. Louis indicate more meat is moving through retail, relative to other consumer outlets, than earlier anticipated. They also show more beef is cut further up the marketing chain because of union restrictions.

Crop Residues in Beef Cattle Rations

About 500 million tons of crop residues are produced annually in the continental United States, but only 25 percent are fed to livestock. Most of the remainder is returned to the land. Additional use of crop residues in beef cattle rations is economically feasible mainly in cases where both beef cattle and residues occur on the same farm so their collection and transportation costs can be minimized.

Feeder Calf Grading

Analysis of Illinois data indicates that frame score, thickness, and degree of fatness are useful in predicting feeding and carcass characteristics for different slaughter weights of cattle.

Hog Production Industry

Hog production accounts for about a third of the U.S. red meat production and generates a sixth of the cash receipts from the sale of all livestock and livestock products. The regional location of hog production changed little since 1950, with about 80 percent produced in the North Central States.

Poultry and Egg Costs and Returns

Models were developed to estimate broiler, turkey, and market egg production and marketing costs and net returns for the Northeast, South, Midwest, and West. Annual regional values for 1976, 1977, and 1978 have been calculated and published as an important element in monitoring interregional competition developments in these industries. They serve as a cross-check on national values and are used in determining costs and profit components of marketing spreads.

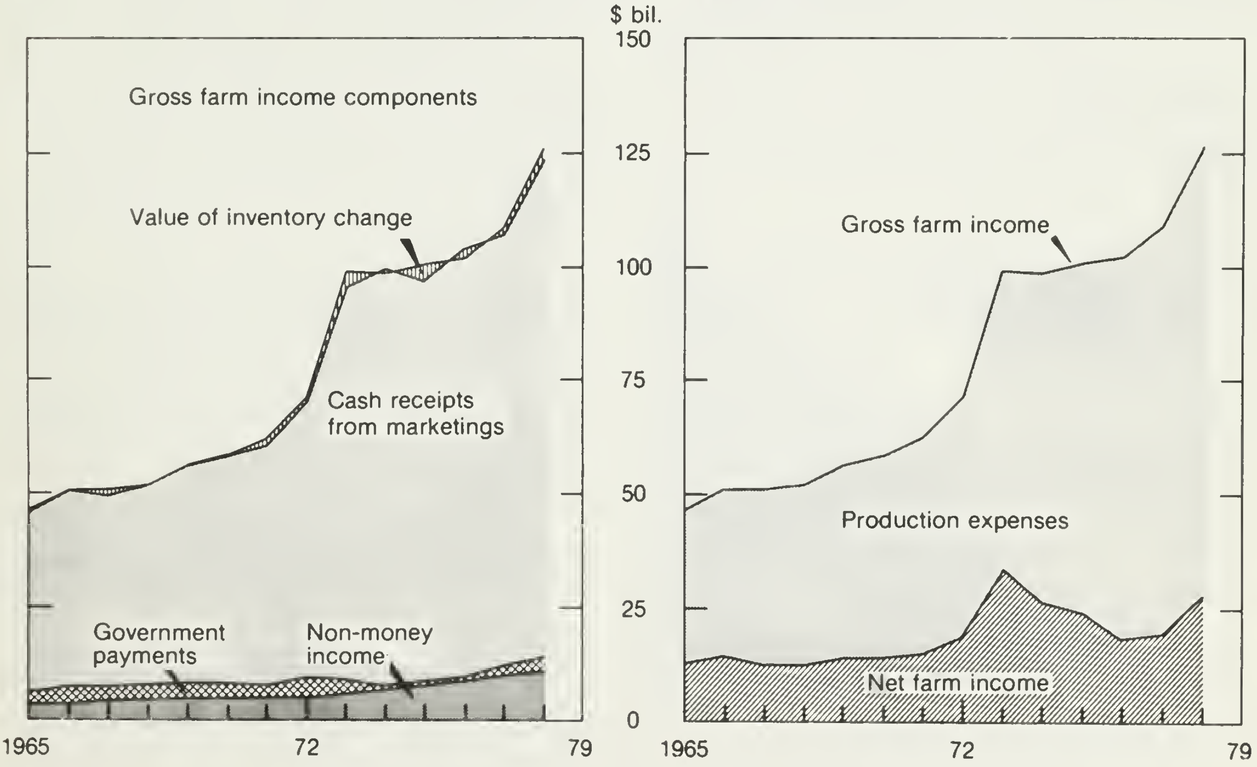
Poultry and Egg Price Spreads

New monthly geographic price and price spread series for the Northeast, South, Midwest, and West for ready-to-cook broilers and medium turkeys and Grade A large eggs were developed to replace the 12-city series maintained from 1956 to 1978.

Changes in Poultry and Egg Subsectors

Subsector performance measurement requires the development and maintenance of data series to document changes. Ownership, concentration, productivity of resource use, and shifts in marketing channels and product forms were analyzed for the poultry and egg industries. In

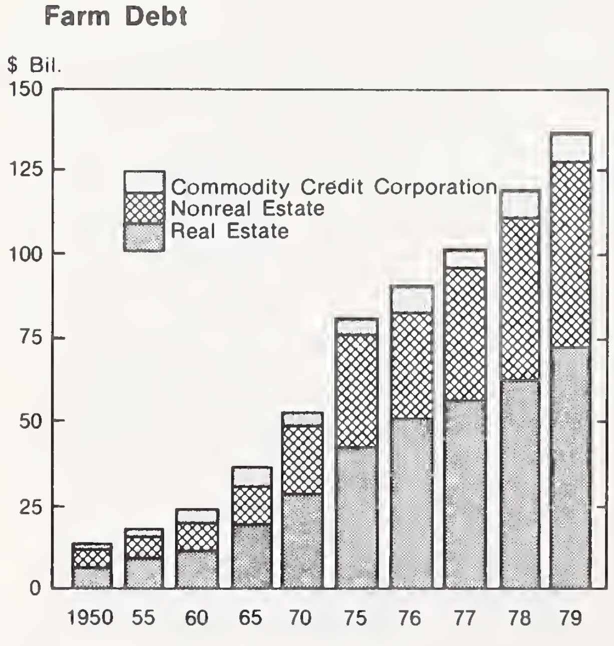
Income from Farming



recent years, there has been a slight growth in concentration of production and processing; increased importance of institutional markets (including fast food outlets); more packer branding; continued development of vertical integration of production, supply, and marketing activities; the emergence of equity problems involving contract growers; and the offsetting of a portion of price inflation on cost factors by further gains in productivity.

Cross Impact Simulation

The cross impact simulation method (CISM) provides an alternative to the predominant strategy for modeling--in this case, applying complex systems to real-world situations. The goal of CISM is to combine highly complex, discipline oriented submodels into one unified model. CISM assumes a researcher's adequate understanding of a system and begins with the researcher's broad view of it based upon experience, intuition, and perceptions--the mental model. In turn, the mental model is transformed into a computer model and appraised for internal logic and consistency. CISM is specifically designed to function in the problem definition stage of a complex research project when the concept of a problem is at a high level of generality, complexity, and vagueness. CISM allows the generality and complexity to remain for analysis, but decreases the vagueness.



Farm loans outstanding January 1. 1979 preliminary.

Marketing Orders and Social Welfare

Persistent inflation has brought Federal marketing orders for fruit, vegetable, tree nut, and speciality crops under severe scrutiny. That marketing orders can neither be condemned nor justified on the basis of their effects on social welfare was the conclusion of a study of four methods of supply management authorized by the orders: product quality standards, which may limit marketable supplies; market allocation, which includes mechanisms for exploiting separate markets with different elasticities of demand; producers' allotments, which may restrict output; and intraseasonal allocation, which controls the seasonal flow of products to market.

Prohibiting product quality standards would increase consumer surplus in the short run. Longrun changes in consumer surplus, however, and both shortrun and longrun changes in producer revenue depend on factors related to how supply and demand are altered by dropping quality restrictions.

Prohibiting price discrimination through market allocation provisions would increase consumer surplus in both the short run and the long run. This gain exceeds producer revenue in the short run, but it may not in the long run, depending on supply and demand elasticities.

Prohibiting allotment orders could generate welfare gains. These orders can effectively restrict total commodity supply, but the two orders presently operating are not capable of doing this because of competition from outside suppliers.

Prohibiting intraseasonal allocation would mean a net loss in social welfare to the extent that these provisions stabilize price and supply within a season. These provisions may also be used to allocate supplies among separate markets, however, so their effects are analogous to market allocation programs.

Economic analyses of food consumption and the behavioral factors affecting human nutrition are provided to help public and private officials make more informed decisions on food assistance, quality, and safety programs. Examples of specific accomplishments are listed below.

Food Expenditures and Consumption

Income, age, sex, race, education, and location of residence are some of the factors that determine the percentage of income a household spends for food and the types of food bought. A model was developed that measures relationships among these characteristics. It can be applied to predict future shifts in consumer demand for food.

Higher income households consume more food away from home than those with lower incomes. They also allocate a greater share of their at-home food dollar to bakery products, beef, veal, fruits, and vegetables. Young upper income men spend more than half their food dollars dining out, while elderly lower income women spend only about 10 percent. The young in general spend three times more than the elderly on soft drinks. Men spend more than women on such prepared foods as frozen dinners, and lower income young men spend the most. Single-person households spend more on food than do multiperson households per person. White households spend more on cereal and bakery products, fruits, dairy products, sugar and other sweets, fats and oils, nonalcoholic beverages, and food away from home, while black households spend more on pork, poultry, eggs, and fish and seafood. Senior citizens spend more of their before-tax income on food than younger persons. The elderly spend more on food at home and less on food away from home than other age groups, buy more fresh fruits and vegetables, and buy less red meats, dairy products, beverages, and prepared foods.

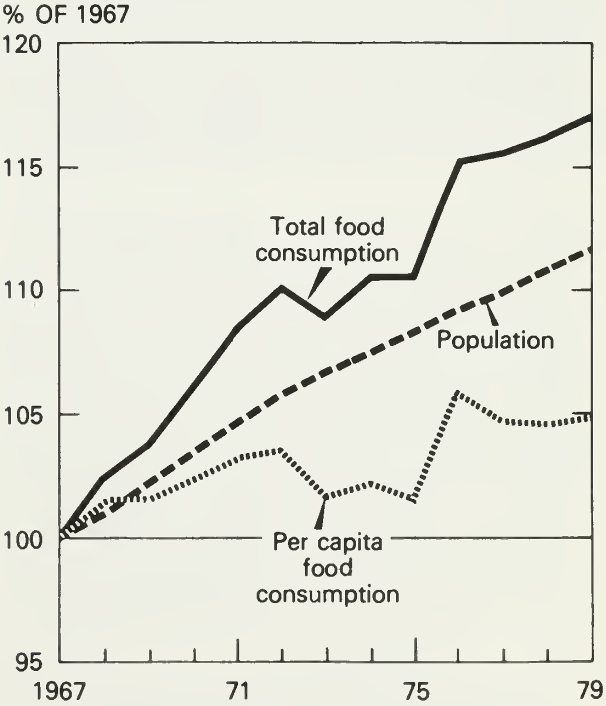
New Series for Food Expenditures

The series currently used to estimate food expenditures yields incomplete and often conflicting data. A new, more comprehensive series, called the total expenditures series, reports total U.S. food sales by all retailers of food consumed both on and off premises. The series also includes food provided to military personnel and food served in hospitals, institutions, and schools, where separate sales figures for food are unavailable. The series separates the total figures by different types of sellers and different food categories and provides estimates of total U.S. food expenditures between 1954 and 1978.

Animal Drugs

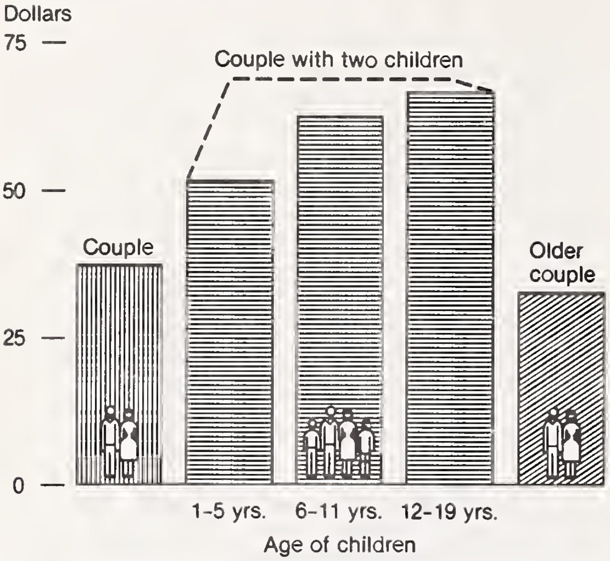
An economic assessment shows that a ban on or restricted use of various drugs in animal feed would cause smaller supplies of pork, broilers, and turkeys, and higher retail prices, farm prices, and net farm income. The higher prices in turn would stimulate production, which would moderate initial price and farm income effects.

Population and Food Consumption



Total food consumption based on retail weight using constant retail prices as index weights. Civilian population on July 1, for 50 States.

Family's Weekly Food Cost



All meals at home or taken from home. USDA low-cost food plan, June 1979.

Nitrite in Bacon

If the use of nitrite to cure bacon were banned because of nitrite's suspected carcinogenic properties, alternative uses for pork bellies would have to be found. Some nitrite-free bacon would be sold, but there would be a lower total yield of pork meat from each hog carcass because part of the bellies would be diverted to the animal fat market. This would probably lower hog prices, food prices, and hog production, increase demand for other meats, and lower net income from pig farming.

Food Stamp and Other Food Purchases

A study of food purchases by food stamp users and by cash customers showed that both groups allocated greater proportions of their food purchases to meat, poultry, and fish than was specified in USDA's Thrifty Food Plan. They allocated similar proportions of their food dollar among the various food product groups, although food stamp customers spent more per shopping trip for most food products. Neither group bought foods giving them the greatest nutrition per dollar spent.

Food Stamp Redemptions

Food stamps are usually used by recipients within the month they are received, but there appears to be some lag in the redemption of the stamps by the Federal Government, probably the result of lags in the banking system. Few stamps are not used or redeemed at some time.

Food Prices in Perspective

Retail food prices in the United States rose an average of over 8 percent annually from 1973 to 1979. Why these increases occurred and what can be done to slow their rate of increase was examined. Substantially reducing the upward movement in food prices will require the same long-term effort needed to reduce inflation in the economy generally. In addition, actions to reduce the volatility in commodity prices are needed.

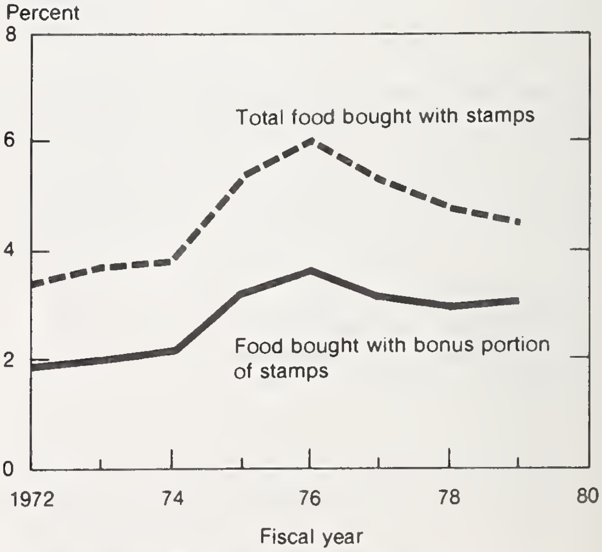
Convenience Foods

Fifty-eight percent of the convenience foods cost more per serving than their fresh or home-prepared counterparts. But most of them require less time and fuel for home preparation and do not seem to differ significantly in eating quality from their counterparts made from home recipes.

Update on Hunger

Food assistance funds generally went to the counties in greatest need between 1967 and 1976. In the Nation's 49 poorest

U.S. Food at Home Bought with Food Stamps



Percent of total expenditures for food at home 1979 preliminary counties, average per person food assistance received rose from $21.98 in 1967 to $153.91 in 1976. Almost 18 percent of each "real" dollar change in per person retail food sales was linked to food assistance payments, 2 percent to adjusted buying power (disposable personal income), and 80 percent to unidentified factors.

Net Weight Labeling

Analyses of the economic impacts of the proposed net weight labeling regulations focused on determining variability of drain liquid between packers and types of pack. Also assessed were the economic costs from additional overpacking, the impact on State weights and measures inspection activities, and the impact of mandatory quality control. The cost and benefits to consumers from the additional overpacking of meat and poultry packages to comply with drained weight labeling throughout the distribution of the product were estimated.

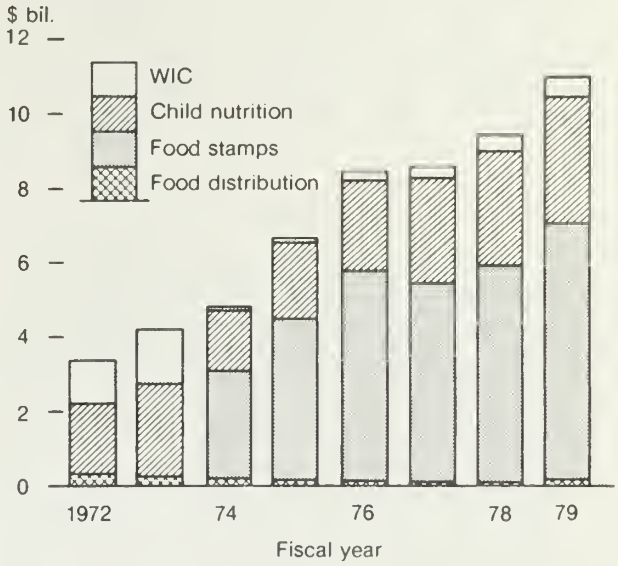
Direct Marketing

A survey of direct marketing activities in Indiana, Michigan, New Jersey, North Carolina, Ohio, and Pennsylvania indicated that the total value of sales made by farmers directly to consumers in those six States was $175 million, ranging from $13.6 million in North Carolina to $51.7 million in Pennsylvania. Products that ranked high in sales volume were floral and nursery products (including bedding plants), apples, peaches, strawberries, sweet corn, tomatoes, snap beans, cabbage, eggs, turkeys, livestock, and livestock products.

Complete Demand Systems

The method and procedure for a new technique to estimate a complete system of demand elasticities were developed. It is now possible to evaluate more precisely the effects of prices and incomes as factors affecting food choice. The method has been applied to a composite commodity system with two food groups and up to 10 nonfood groups, based on U.S. Department of Commerce expenditure data. A matrix of 144 price and income elasticity parameters was obtained. A similar composite system was estimated for several food commodities and a nonfood sector.

USDA Funding for Food Assistance



1979 preliminary

Transporting Farm Products

Railroads experienced a large increase in semiperishable product traffic, primarily grain and soybeans, but suffered a substantial decline in the movement of perishables, such as fresh fruits and vegetables and livestock, between 1954 and 1976.

Rural Road System

Thirty-one percent of the rural road system has surfaces of low load-bearing capacity. Truck traffic on these roads has increased in frequency and load size, resulting in higher maintenance costs. State and local disbursement for road expenditures and maintenance decreased, in real terms, from 1971 to 1978. Fuel taxes are a main source of revenue and are assessed on the basis of quantity, so any decrease in consumption due to a fuel shortage will make the situation worse.

Commodity Removal Impact Model

A model for tracing the impact of Federal commodity purchases to the farm level was updated and modified for 24 commodities. The model is capable of estimating price and income effects as well as monitoring nutritional aspects of the foods removed through commodity acquisition programs. The model is being expanded to 61 commodities. Tradeoffs in such objectives as maximizing contributions to farm income or purchasing specified commodities for price support purposes are shown in model output. Data on regional distribution of benefits and ranking of commodity purchases according to various criteria can be obtained.

Agricultural and Food Policy

Analyses are made of national and regional effects of a broad range of alternative Federal programs and policies regarding their impact on farm prices, farm income, food costs, exports, and other aspects of U.S. agriculture. Much of the work concentrates on the major commodity programs; however, it also includes analyses of commodity reserves, crop insurance, import restrictions, indemnity programs, and others. Most of this work, as indicated below, is performed for those involved in departmental program and policy decisions.

Dairy Policy Analysis

ESCS was the primary source of analysis of the legislation introduced in Congress to extend the 80-percent minimum support level provision of the Food and Agriculture Act of 1977 which expired March 31, 1979. It enabled the Department to suggest an amendment that would improve the flexibility to manage the program and to adjust support prices if net purchases of dairy products by the Commodity Credit Corporation exceed specified levels.

1979 Beef Import Legislation

Several new beef import bills introduced in Congress were evaluated in terms of the effects they would have on farm income and food prices. The bills contained similar features that had the effect of causing increases in beef imports during the buildup phase of the cycle, and decreases in beef imports during the liquidation phase of the cycle, in order to stabilize prices.

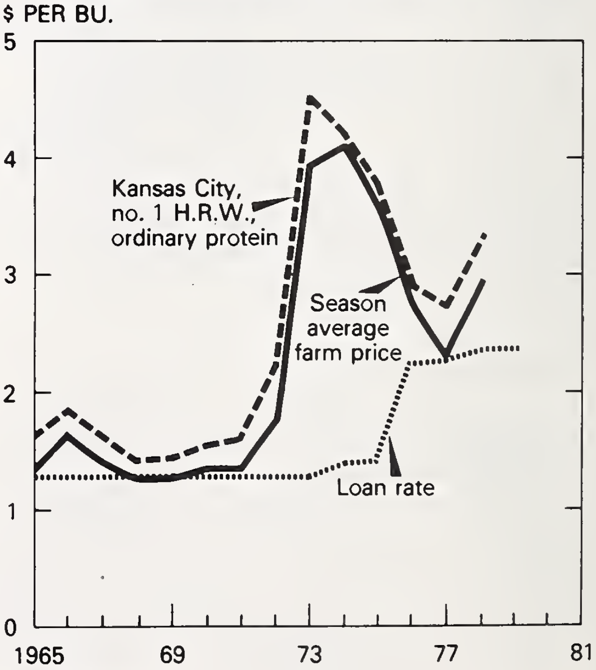
Government Payments

An analysis of payments to farmers under the 1978 wheat, feed grains, cotton, and rice programs showed that the largest 10 percent of the producers in terms of acreage received about 45 percent of the payments, while the smallest 10 percent of the producers received only 1 percent of the payments. Those ratios are largely unchanged from the findings of an earlier study based on 1964 data. The ceiling on payments, $40,000 for wheat, feed grains, and cotton, and $52,250 for rice, saved about $25 million in Treasury outlays. Large producers participated in the commodity programs to a greater extent than small producers.

Prohibiting Commodity Program Payments

Prohibiting Government commodity program payments to widely held and

Wheat Prices and Loan Rate



Year beginning June 1. 1977 and 1978 preliminary.

nonfarm corporations and partnerships, considered in the 1977 Food and Agricultural Act, would have only a minor impact on the ownership and operation of farms or on the effectiveness of the commodity program. If applied in 1978, it would have had a limited effect on some 2,700 to 17,000 corporations and 21,000 partnerships. Under the broadest definition, about 9,000 tenants of corporate owners would have been excluded. The excluded farms would have produced only about 500,000 additional acres of the program crops in 1978. This would have saved the Treasury $9 million in payments, but could have cost an additional $27 million for storage.

Potato Diversion Programs

An analysis of the effectiveness of potato diversion programs in Maine and for Russet producers (primarily in the Pacific Northwest) concluded that an additional diversion from food uses of 3 to 5 million hundredweight was needed to ensure the U.S. average farm price goal of $3.20 to $3.30 per hundredweight. Estimates were made of diverted tonnage needed to raise producer prices to offset rising costs and record high production. About 1.5 million hundredweight of Maine production was actually diverted from normal market channels, and 5 million hundredweight was diverted in Idaho. The impact on consumers was estimated to be 40 cents per hundredweight at the retail level in the Russet program and 12 to 16 cents per hundredweight in the Maine program.

Sugar Policy Analysis

Evaluations of numerous policy options for the proposed sugar bill were performed to provide policymakers with projections of Treasury costs and of benefits accruing to consumers and producers. The analysis considered different price support levels, direct payment mechanisms, Commodity Credit Corporation loan activity, international trade alternatives, and world price levels. Five-year scenarios were constructed under various assumptions. The overall effect of the proposed legislation was found to be $1.2 billion in Government revenues and $600 million in costs to consumers for the 3-year duration of the bill.

Peanut Policy Analysis

An econometric model of the U.S. peanut industry was developed to analyze the effects of Government policy. Government programs were found to increase income to producers and to increase the costs of peanut products to consumers. The programs' indirect costs to consumers from 1952 to 1976 were nearly $3 billion, direct costs to the Government were almost $1 billion, and the increase in farmers' income was $1.4 billion.

Program History

The history of events and laws passed by Congress from 1933 to 1978 was documented to provide a foundation for implementing future farm legislation. The history begins with the major proposals of the twenties for handling and marketing farm surpluses, records the establishment of the Federal Farm Board in 1929, continues with the Agricultural Adjustment Acts of 1933 and 1938, and traces price support and adjustment legislation through 1978. Legislation in 1973 and 1977 was in most respects a continuation of programs and goals that had been in effect for 45 years. These included adjusting production to demand and providing farmers with limited price supports for their major products. The new legislation provided farmers greater freedom in deciding what they grew and related price supports more closely to recent prices and to cost of production rather than to parity.

Foreign Demand, Supply, Trade, and Development

Information is provided to help improve departmental and private industry decisions on U.S. and world agricultural trade and foreign assistance programs. Specific research areas include U.S. trade policies and programs, estimates and forecasts of U.S. agricultural trade, continuing analysis of agricultural sector and economic policy developments in foreign nations, long-term projections of demand for U.S. agricultural products by foreign nations and competitive production abroad, and analysis of such special issues as commodity reserves, price stabilization, monetary adjustments, tariffs, trade barriers, and transportation costs. Examples of the types of information produced are indicated below.

World Cotton Production and Use

The rate of decline in cotton's share of the world fiber market is expected to slow because of increasing affluence in developing countries where cotton represents a high proportion of total fiber consumed, a stabilization of cotton's share in developed nations, worldwide population increases, and expected increases in manmade fiber prices. World cotton consumption and production could reach between 70 and 75 million bales by 1985 and between 75 and 85 million bales by 1990, depending on world economic growth.

Indexes of Agricultural Production

Annual indexes of agricultural production in all regions of the world were prepared as part of a continuing assessment of the current agricultural situation abroad. Per capita agricultural production in the Third World has not changed significantly.

Farm Product Exports

U.S. agricultural exports totalled $32 billion in 1979, up $4.7 billion from 1978. Increased values from year-earlier levels included feed grains, oilseeds, cotton, tobacco, rice, fruits, and edible nuts. Agricultural exports exceeded imports by $15.8 billion, up from $13.4 billion in fiscal year 1978. The agricultural trade surplus is of increasing importance to the United States as a means of offsetting energy imports.

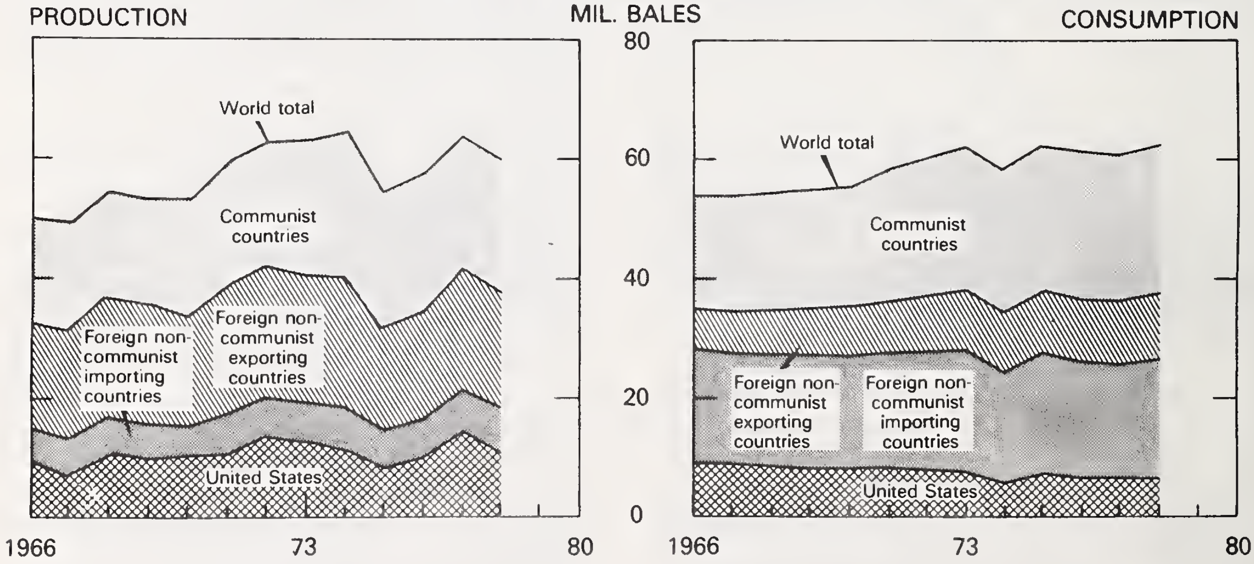
U.S. Agricultural Imports

U.S. farm imports of $16.2 billion were 17 percent higher during fiscal year 1979 than a year earlier. Principal value gains in imports occurred for meat, meat products, coffee, natural rubber, fruits, vegetables, nuts, oilseeds, and oilseed products. The level of imports affects farm income and food prices and thus is a critical issue for policymakers.

U.S.-Mexican Agricultural Trade

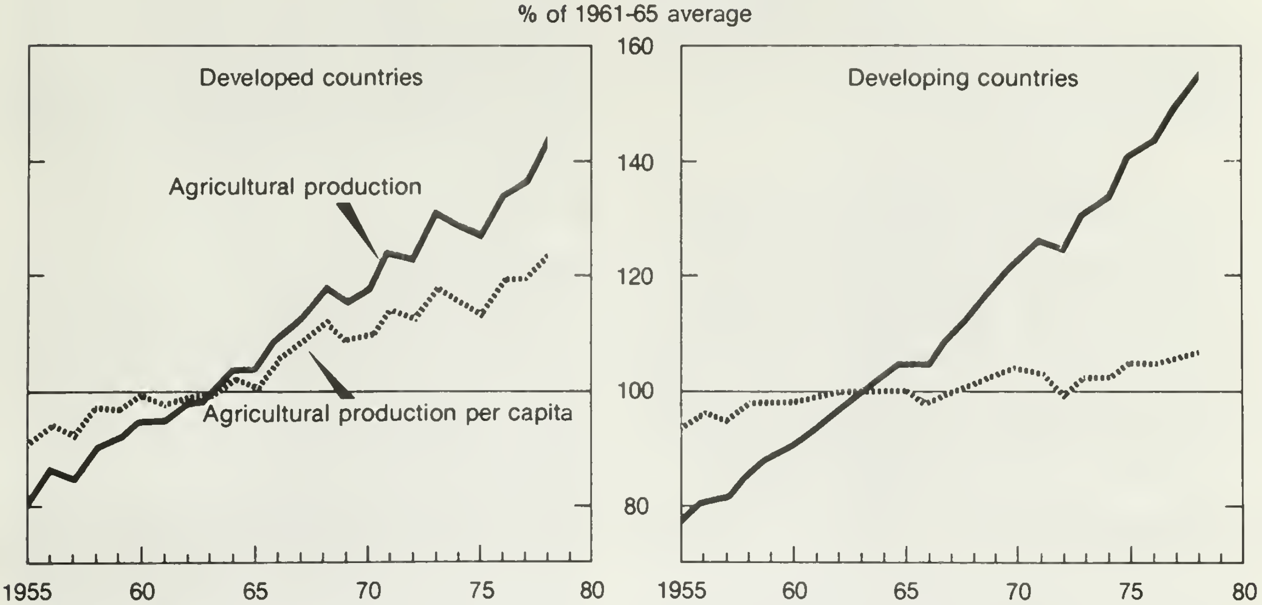
Trade with Mexico continues to rise in importance as U.S. farm product exports to

Where World's Cotton is Grown and Used



Year beginning August 1. 1977 preliminary 1978 estimated.
A bale is 217 metric tons (480 pounds) net

Changes in Agricultural Production



Developed countries include United States, Canada, Europe, USSR, Japan, Republic of South Africa, Australia and New Zealand
Developing countries include South and Central America, Africa (except Republic of South Africa), Asia (except Japan, Communist Asia).

that country reached their second highest level in 1978. A $1.1-billion record for agricultural imports from Mexico contributed to the increase in trade between the two countries. Wheat, coarse grains, and oilseeds are the most important commodities among agricultural exports; coffee, fresh vegetables, and feeder cattle are the largest import items.

World Agricultural Situation and Outlook

An extensive program of work was carried out to provide a continuing comprehensive analysis of world agricultural developments from both commodity and regional points of view, supported by analyses of overall world demand and financial conditions, U.S. agricultural trade, price movements, and international food and trade policy developments.

Findings published in "Analysis of China's Grain Trade," Chinese Economy Post-MAO, indicated that imports will continue to provide an important part of the grain supplies for China's coastal urban areas. U.S. exports to China will remain highly variable and substantial.

ESCS, in cooperation with the Foreign Agricultural Service and the World Food and Agricultural Outlook and Situation Board, conducted quarterly reviews of the prospects for U.S. agricultural trade for the year ahead. The monthly Foreign Agricultural Trade of the United States (FATUS) provided analyses of factors and developments affecting U.S. agricultural trade, including Food-for-Peace shipments and detailed statistics on trade by commodity, country, major trade blocs, transshipments of U.S. farm products, and State shares of agricultural exports.

Staff analyses for use by departmental policymakers and Congress included: set-asides for wheat, coarse grains, and rice; policy options following the unsuccessful negotiations to establish an international wheat agreement; and the impact of 90 percent of parity pricing on agricultural trade in major world regions. The set-aside analyses concluded that a continuation of past production and consumption trends will result in strong export demand for U.S. grain in the next several years. The analysis on 90 percent of parity concluded that without cooperation from competitive exporters of grain, oilseeds, and cotton, the volume of

U.S. agricultural exports would decline substantially if the United States priced its agricultural commodities at 90 percent of parity in the international market.

Global Assessment

The unmet needs of the lowest income countries for farm products are large relative to their domestic production. The greatest needs are concentrated in about 24 countries, and are much larger than past food aid transfers. To meet these deficits requires accelerated growth in their domestic production, increased export earnings to finance food imports, and more uniform distribution of food supplies across population groups.

Canadian Land Use

Canada is an important market and an important competitor for U.S. farm products. An assessment of Canadian potential showed an additional 38 million hectares of land could be brought into farm production using classes 1 to 4 land; this includes land capable of producing commonly cultivated crops and marginal land considered to be at the break-even point for commercial agriculture. If the land were developed, it would permit Canadian wheat production to rise from the 1970-79 average of 17 million tons to 32 million tons.

USSR Grain Situation

Grain has played an increasingly important role in the USSR's livestock feed base since the midfifties. Today, such feeds supply just over 40 percent of all nutrients to the livestock industry. With present feeding practices, current USSR livestock production goals for 1980 and 1985 are too costly in terms of feed, and outstrip the agricultural sector's ability to supply them. Grain imports will continue in the near term, with emphasis on coarse grains. If feeding efficiencies do not improve, grain imports may become a permanent fixture in the USSR's agriculture.

Natural Resources

Work in this area provides information on the supply, demand, and control of natural agricultural resources to be used for planning and managing the Department's land and water conservation programs. Specific objectives are to: inventory the availability, productivity, current use, ownership, and rates of depletion or improvement of land, water, and energy resources; determine sources and effects of changes in land values, and develop improved measures of value; evaluate the effect of domestic and alien ownership on the availability of natural resources to agriculture and the impact on the structure of agriculture; develop national and regional economic analysis tools to aid departmental decisionmaking on natural resources and the environment; provide planning assistance and economic analysis for the Department's resource conservation and development (RC&D), small watershed, and river basin planning programs; and provide technical assistance in resource inventory and evaluation of resource development options in selected developing countries and for use in departmental program management. The following are examples of work completed.

Biomass Farms

The energy shortage has heightened concern to find new sources. One study suggests that biomass crops grown for energy conversion would require high-quality land to maximize energy gain and minimize environmental hazards, but the shortage of such land would hinder the development of energy farms. Most of the 760 million acres of rural land of sufficient quality to support biomass production would need considerable conservation measures to overcome inherent development problems. Furthermore, alternative sources of food and fiber production would need to be found if great areas of land were diverted to energy farms.

Irrigation and Energy Use

The area irrigated by pumping from wells, rivers, and lakes increased from 35 million to 40 million acres between 1974 and 1977. The energy to pump the water cost $1 billion in 1977, an increase of $430 million since 1974. Electricity and natural gas are the primary energy sources for pump irrigation, but the use of diesel fuel nearly doubled.

Rising energy prices resulted in lower income to irrigators, but had minimal effect on food prices. Some irrigators may find returns inadequate to cover all fixed costs, so rising energy prices may retard investment in new irrigation development and replacement of older irrigation equipment.

Declining groundwater supplies and increasing energy prices in the Texas High Plains will significantly affect irrigated acreage, cropping patterns, and net farm income. If natural gas prices remain constant, irrigation pumping will decline from 5 million acre-feet in 1976 to 1.2 million acre-feet by 2025, and net crop income will decline from $277 million to $186 million. If natural gas prices triple between 1976 and 2000, as projected by the Texas Governor's Energy Advisory Council, irrigation of major crops will likely terminate in 1995, and annual net crop income will decline to $164 million.

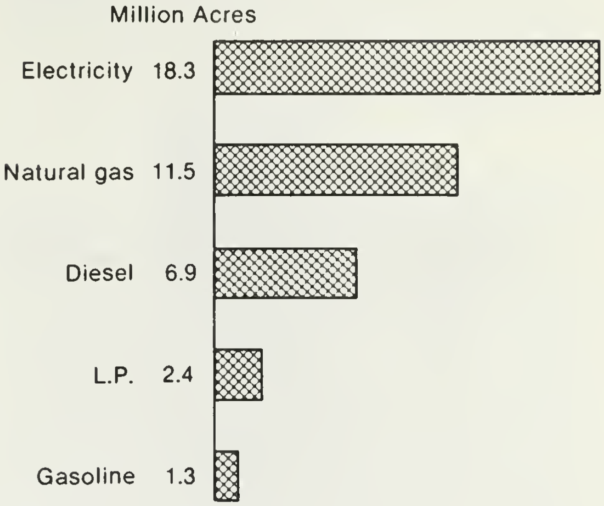
Coal and Oil Shale Development

Strip mining accounts for 47 percent of current coal output in the East. This exceeds the 14 percent classified as strippable. However, only 16 percent of the additional mining capacity now planned in the East is for strip-mined coal. Eastern strip mining nevertheless will expand in the immediate future on the 14 billion tons of strippable coal reserves in this region, where coal mining and farming are not in competition for the same land as they frequently are in the Midwest.

In eastern Kentucky and southern West Virginia, which contain 7 billion tons of strippable reserves and even more deep mineable reserves, the potential for greater employment and income and a halt to the emigration of population is tied substantially to coal development.

Energy development from oil shale faces problems with water in both the Northern Great Plains and Rocky Mountain regions. The coal deposits in the Northern Great Plains extend over large areas, while oil shale development in the Rocky Mountain region is highly concentrated in the upper reaches of the Colorado River basin. The problem in the Northern Great Plains is one of location and of irregular water flow. To solve this would require the construction of large-scale, costly water impoundment and transportation facilities, use of unit trains, and more efficient use of water. In contrast, the problem in the Colorado River Basin is one of water availability because of the fragmentation of the water market. Three States hold rights to the water, while the State with the greatest amount of oil shale (Colorado) has the least undepleted surface water flows. Water rights would have to be purchased from agricultural producers in some areas.

Acres Irrigated with Pumped Water by Type of Energy Used



1977 data

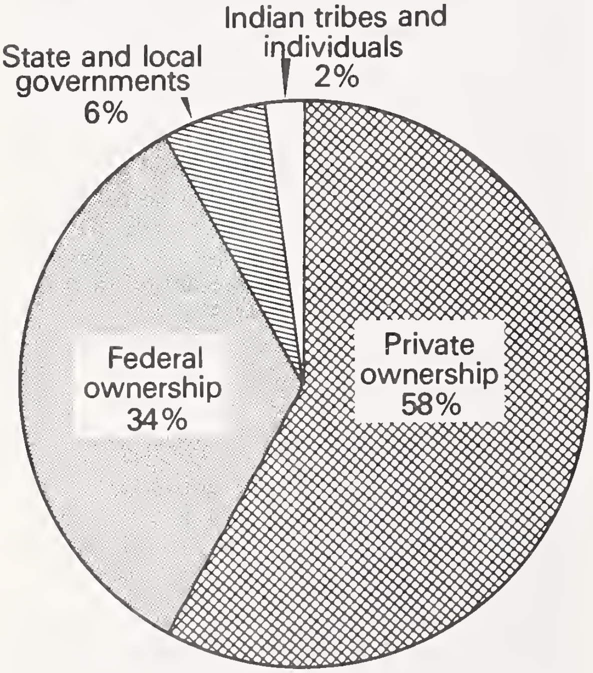
Regulating Corporate Farming

Ten States had enacted legislation as of December 1977 restricting corporate farming (farm operations, vertical integration, and ownership of farmland). The intent was to protect the family farmer from competition by large agribusiness firms. However, an analysis of data from the census of agriculture and the Internal Revenue Service suggests that these statutes may be premature; corporate farms with more than 10 shareholders accounted for only 5 percent of total U.S. agricultural sales. As a result, some States are considering enacting laws that only authorize gathering more specific information.

Who Owns the Land?

About 40 percent of the U.S. land area of 2.3 billion acres is owned by government (Federal, State, and local), leaving 60 percent in private hands. Most of these owners are white males between the ages of 50 and 64. Half of the privately owned land is owned by only 1 percent of the landowners. About 40 percent of the land is owned by farmers, 16 percent by corporations and partnerships, 15 percent by retired people, 13 percent by other workers, laborers, and housewives, and 12 percent by people in professions, management, and sales. About 1 percent of the owners of farmland and ranchland own 30 percent of that land. A few owners are foreigners.

Land Ownership in the United States



1974 data.

Foreign Investments

Concerns about foreign investments in U.S. land include the impact on the inflation of land prices, U.S. control over its food production, local community activities and responsibilities, and land use. Foreign investment is expected by some to increase as more foreigners become aware of the financial benefits of investing in U.S. farmland.

Average farmland value across the United States has more than doubled since 1970; in some areas, it has tripled. These increases have well outstripped the increases in the general inflation rate and the Standard & Poor's index of 500 stocks over the same period. Between January 1, 1977, and June 30, 1978:

--Foreign investors acquired about 827,000 acres of farmland and ranchland, of which 341,000 acres were cropland. Those purchases are equivalent to an annual foreign purchasing rate of about 500,000 acres of farmland and 250,000 acres of cropland.

--At that rate, foreigners would acquire ownership of an additional 1 percent of U.S. farmland within 19 years and would acquire ownership of an additional 1 percent of U.S. cropland within 20 years, provided they did not sell or transfer the land to U.S. citizens.

--About 90 percent of land transfers to foreigners were in 20 States. Oregon was first in acreage sold (most of that in one large ranch), followed by Texas, Georgia, Louisiana, and Arkansas.

Normalized Prices for Resource Planning

Normalized prices are estimated prices used to forecast water and related land resource returns. A new ESCS report examines the characteristics of normalized prices issued periodically by the U.S. Water Resources Council. It also evaluates several alternative procedures--trend analysis, weighted average techniques, and a structural approach--for calculating normalized prices. These techniques should be of particular interest to analysts and planners in public agencies of all levels of government.

Conservation Issues

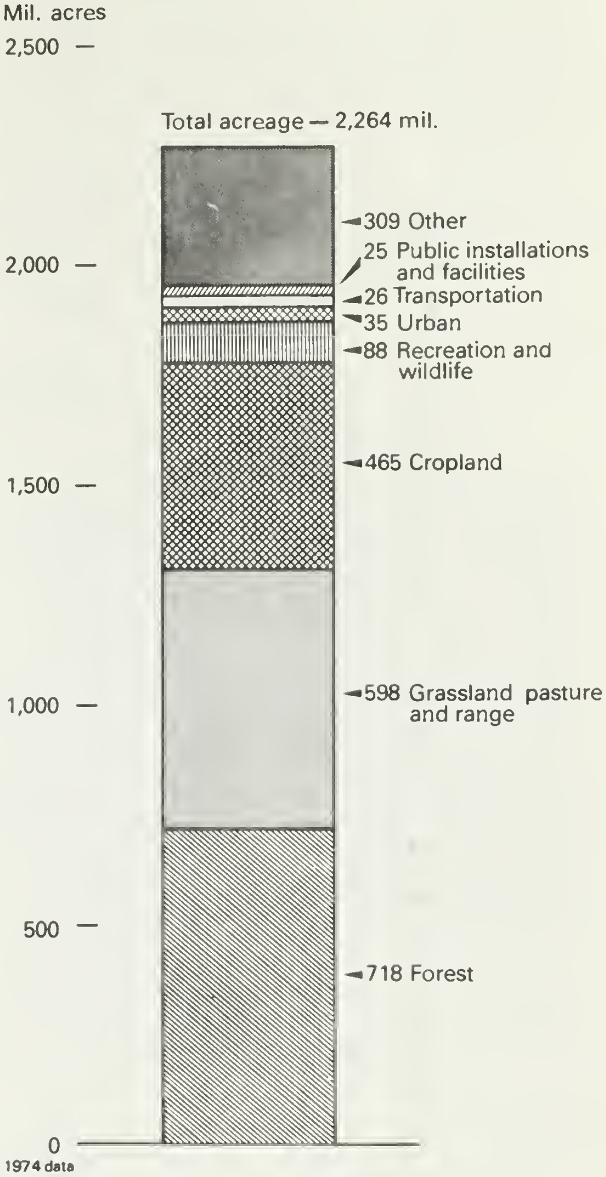
River basin studies are carried out in all parts of the Nation. Ten studies were completed and eight new ones started to detail the socioeconomic characteristics of individual river basins, make estimates of production costs and income from farm production, and develop models to assess the impact of alternative water resource development strategies.

A study in the western half of South Dakota measured the effects of a combination of improved crop rotations, conversion of better quality range to cropland, land treatment practices, conservation tillage, and improved management techniques on farm income. It showed that adoption of a combination of improved practices could double the net income from farm production in the next 20 to 25 years. Losses from water erosion could also be reduced substantially, but some increase in wind erosion would occur as a result of larger acreages being cultivated. Combined erosion losses would decrease.

The productive but highly erosive lands in the Palouse River basin in eastern Washington lose millions of tons of topsoil annually. Minimum tillage, strip cropping, and related conservation practices were found to reduce losses by 40 to 60 percent without adversely affecting farm income. Additional reductions in soil loss are possible, but more costly. Retirement of steep, badly eroded lands from production would benefit wildlife habitat and reduce damage to recreation areas and drainage channels.

A study of factors affecting adoption of conservation practices in the Maple Creek area of Nebraska indicated a difference in the perception of soil erosion problems between the Soil Conservation Service (SCS) and the farmers. SCS classified 32 percent of sample farms as having major soil erosion problems, while the farmers acknowledged problems on only 2 percent of the farms.

Major Uses of Land



Larger farms generally used more conservation practices than smaller ones.

Data and Analytical Systems

Economic information was developed to help implement the planning provision of the Resource Conservation Act. A land and water resources and economic modeling system was established to show how different factors interact with conservation programs and practices. This was supplemented by a new hybrid model that provides regional impact assessments by types of commodity produced and by a file of soil depths of various fields throughout the Nation. This data file allows direct economic evaluation of conservation programs designed to limit soil loss.

Refined resource productivity units and production potential area descriptions and delineations were completed for the Dominican Republic, and initial ones were prepared for Costa Rica, Nicaragua, and Syria. Additional information on cropping patterns, yields, and related socioeconomic data were collected and incorporated into the agricultural resources information system (ARIS). Experimental activities in the use of land-satellite imagery and development of an analytical computer system technique for resource program evaluations were also completed.

Environmental Quality

This research focuses on the environmental, economic, and social impacts of Federal environmental quality standards, regulations, policies, and programs on agriculture and rural areas. Specific objectives are to: develop improved economic research tools for policy analysis and evaluation of pest control and water quality programs, develop nationwide information on pest control, including chemical, biological, and cultural control methods; determine cost effectiveness and economic impacts of alternative pest control and water quality strategies, including integrated pest management practices; and assess the economic and environmental effects of water quality and pest control programs and policies, including impacts on farm production, costs, and income, and on consumer prices. The findings of some of the work completed are listed below.

Pesticide Use

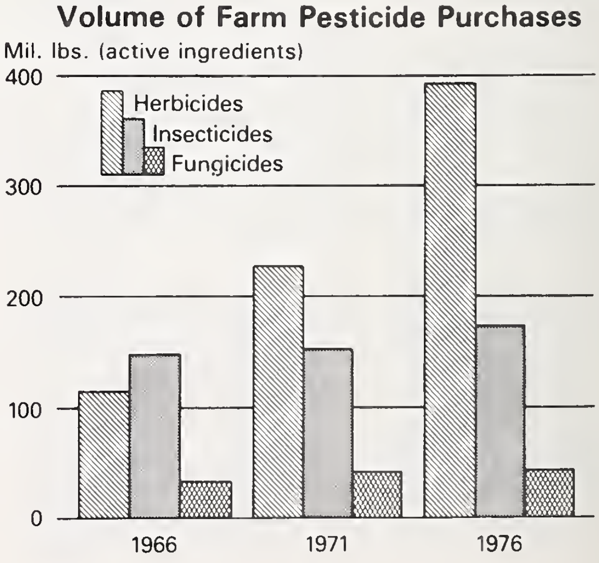
Pesticides have been associated with much of the large yield increases in modern farm production. Farmers used 661 million pounds of pesticides in 1976, up 38 percent from 1971. Crops accounted for 98 percent of farm pesticide use, and herbicides accounted for 60 percent of the crop use. Herbicides also accounted for most of the overall rise in pesticide use between 1971 and 1976, increasing 76 percent. A slowdown in the pesticide growth rate can be expected, however, because of concern over possible adverse effects and because of greater use of such alternatives as biological controls and integrated pest management.

Pesticide Regulations

Economic assessments were made of the effects of restrictions or bans placed on the use of 2,4,5,-T, EBDC, EDB, Benomyl, Dimethoate, Diflubenzuron, and Lindane for agricultural purposes.

The herbicide 2,4,5-T has been suspended from use on forests, rights-of-way, tame pasture, and all other uses except weed and brush control on rangelands and rice. The estimated first year economic loss of 2,4,5-T on timber lands is $23 million, accumulating to $800 million at the end of 10 years.

EDBC's are fungicides used to control fungi on a wide range of agricultural crops, including deciduous and citrus fruits, vegetables, peanuts, potatoes, and



small grains. Economic losses to users of EBDC's could be $146.4 million.

EDB is a nematicide used in the production of citrus fruits, cotton, peanuts, peaches, pineapples, tobacco, and vegetables. It is also used as a space fumigant in forestry, termite control, grain storage, flour milling, stored honey combs, and quarantine programs. Losses would range from $57.8 million to $62.5 million without EDB.

Benomyl, a fungicide, is used on a wide variety of crops. Preliminary results of human risk analyses conducted by the Environmental Protection Agency indicate no risk to the general population. However, there appears to be an environmental risk to aquatic organisms. Annual losses of $15 million would result if benomyl were not used in rice production.

Dimethoate is an insecticide used in a variety of agricultural activities to control mites, aphids, and grasshoppers. Cancellation of dimethoate could result in a loss of over $20 million.

Diflubenzuron is currently registered for gypsy moth control in hardwood forests and was approved for boll weevil control on cotton in 1978 and 1979. Diflubenzuron is a specific action insecticide that maintains beneficial insects whose predation decreases the need for insecticides to control other insects. The combined effect of direct boll weevil control costs and decreased need for insecticide controls was estimated at $10.5 million.

Lindane, an insecticide, is used to control bark beetles and wood-boring insects in the hardwood lumber industry, to protect against soil insects as a seed treatment, and to control a wide variety of insects in livestock production. The economic impact of cancelling lindane use was estimated at $147 million for hardwood lumber and $1.1 million for livestock.

Pest Management

Biological control of the Mexican bean beetle (MBB) by the parasitic wasp *Pediobius foveolatus* is, to varying degrees, an economically feasible alternative to conventional control in every region in which the MBB is the major insect pest. Only small changes in soybean farmers' net revenues would occur if biological control were substituted for conventional control.

USDA's research station at Bryon, Ga., developed and tested a multipest management program for pecans. Analysis of the experiment's results found that yields and pest control costs on the pest management orchards were significantly higher in 1977 than those for the conventionally treated orchard.

Cotton production in 1976 required more insecticides than any other crop. The control of the *Heliothis* complex--tobacco budworm and bollworm--required close to 26 million pounds of insecticides, or 40 percent of the total used on cotton. Alternative biological control techniques are being developed, such as the use of *Trichogramma*, an egg parasite, and *Bacillus thuringiensis* (B.T.), a bacterium larvacide. *Trichogramma* and B.T. are cost efficient and could be used in Georgia, North Carolina, and South Carolina. However, combined use of the two biological control agents may not be cost competitive.

Minimum Tillage

In a study of soils in Ohio, Indiana, Illinois, and Iowa, 41 percent of the tillable acreage was classified physically suitable for the use of no-till systems of crop management, 23 percent for reduced tillage, and 33 percent for conventional tillage only.

Water Quality

A system for simulating phosphorus management for problem watersheds was developed. The system includes physical models which represent watershed hydrologic characteristics as they affect delivery of sediment and phosphorus to reservoirs.

Waste Management

A study of communities applying municipal effluent to land found that successful systems had evolved when farmers and municipal officials had informally worked together to solve waste treatment and water scarcity problems. Economic, political, and legal factors were found to be important as well. Limits on wastewater discharges were found to provide cost savings when advanced wastewater treatment was required.

A study of 47 collection and solid waste disposal systems in rural cities of less than 10,000 population showed there were economies of size in solid waste collection. Excess truck capacity and labor in smaller communities resulted in high costs.

Research on solid waste management in rural Southeastern communities found that collection costs ranged from $9 to $53 per ton. Variable costs represented 71 to 95 percent of these costs. Wastes were commonly disposed of at county-owned landfills.

Rural Development

This research provides information to improve the effectiveness of decisions of USDA and of other public agencies that plan and manage the development process for different types of rural communities. Specific research areas include demographic trends, markets for rural labor, indicators of rural well-being, revenue sources for local governments, adequacy of community services (such as water, sewerage, health, education, housing, energy, credit, and transportation), and impact of Federal programs and policies on rural growth. Some of the research results follow.

Nonmetro-Metro Employment

Industrial job growth appears to favor nonmetro areas and regions outside the Northeast and Midwest. Employment in nonmetro areas increased in 18 of 20 major manufacturing industries during 1967-73, while metro area employment declined in 11 industries. This compared with total U.S. growth of 0.8 percent, or about 145,000 jobs. Nonmetro areas had only 35.8 percent of the growth in energy-intensive manufacturing industries.

Metro women are more likely to be in the labor force than are nonmetro women, but the difference in participation rates narrowed between 1960 and 1970. Nonmetro women are more likely to hold relatively low paying clerical, operative, and service jobs than their metro counterparts.

The nonmetro annual average unemployment rate declined from 7 percent in 1976 to 6.6 percent in 1977. Comparable rates in metro areas were 8 percent and 7.3 percent. Nonmetro rates have been lower than metro rates for several years.

Total personal income increased 25 percent faster in nonmetro than in metro areas between 1968 and 1975, and the gap in real per capita income narrowed by a tenth during the 8-year period. The superior income growth performance of nonmetro workers was due in part to a more than tripling of government payments for retirement annuities, unemployment compensation, and welfare payments. Transfer payments accounted for 18 percent of the increase in total personal income in nonmetro areas, compared with 14.5 percent in metro areas. These payments were especially important sources of nonmetro income growth in the Northeast (24 percent), South (19.4 percent), and in rural counties far removed from large cities (19 percent).

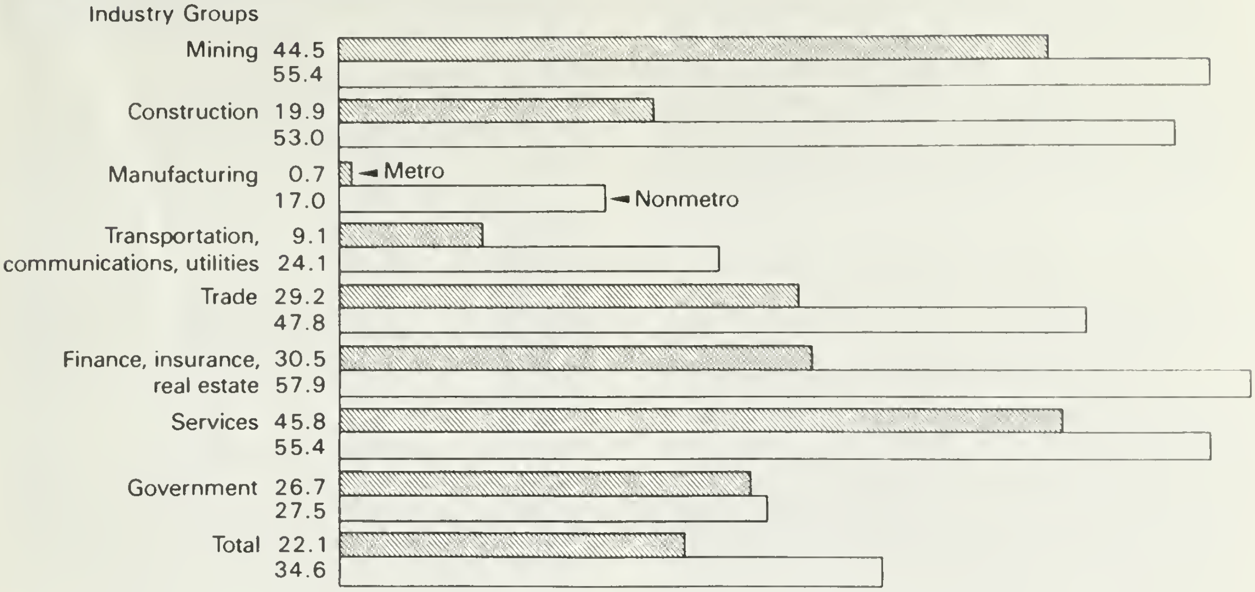
Nonmetro Commuters

Continued emphasis on energy conservation has raised concern about the long commuting distances in rural areas. A study indicated that the mean commuting distance was about 8.7 miles for employed household heads living in nonmetro counties in 1975. Nearly 16 percent of the household heads traveled 20 miles or more, about 70 percent drove to work alone in a private car, and about 20 percent were in car pools.

Farm Population

The total U.S. farm population declined between 1970 and 1975, but the

Percent Change in Nonfarm Wage and Salary Employment, 1970-79



Metro excludes about 50 standard metropolitan statistical areas. Source: Bureau of Labor Statistics and State Employment Security Agencies.

population on farms with annual sales greater than $40,000 increased 76 percent. Such farms accounted for nearly 80 percent of total farm receipts. Farms with under $2,500 in annual sales contained a third of the U.S. farm population that received most of its income from off-farm sources.

Some of the increase in the number of farm people living on farms with annual sales greater than $40,000 reflects general price inflation of the value of products, but at least part of it is a real increase in products sold.

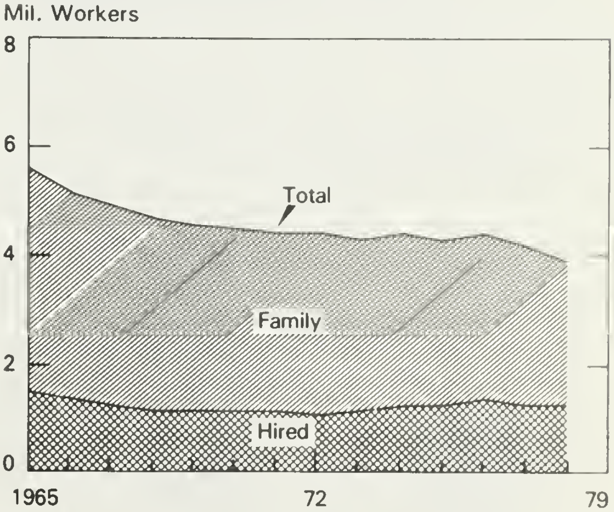
At the lower end of the scale, the population on farms having sales of less than $10,000 dropped by 24 percent. Only 10 percent of farm people were on rented farms without any land of their own, and this proportion continues to fall.

Thirty-nine percent of all farm people were on livestock farms and ranches in 1975, making this the most common single type. Twenty-seven percent resided on cash grain and soybean farms, and 12 percent on dairy farms. These percentages fluctuate only slightly from year to year as commodity prices shift. Cotton and tobacco farms combined now account for only 9 percent of the total farm population, a considerable decline from the past.

Social Well-Being in U.S. Counties

Four composite indexes of social well-being were constructed for 3,097 U.S. counties as part of the search for better indicators. The indexes are socio-economic, health, family status, and alienation. National patterns of these

People Employed on Farms



Average number of persons employed in 1 survey week each month - through 1974 the last full calendar week ending at least 1 day before the end of the month; beginning with 1975, estimates are quarterly and include the week of the twelfth of January, April, July, and October. The chart titled "People Employed on Farms" is based on a quarterly average, the others include anyone who did hired farmwork during the year.

composites are depicted by U.S. county maps and through mean index scores of counties grouped by metro-nonmetro status and rural-urban orientation. Counties and metro-nonmetro county groups vary, as do geographic regions, in their basic patterns and degrees of well-being, indicating that social and economic development programs should be tailored to the needs of each region or type of county.

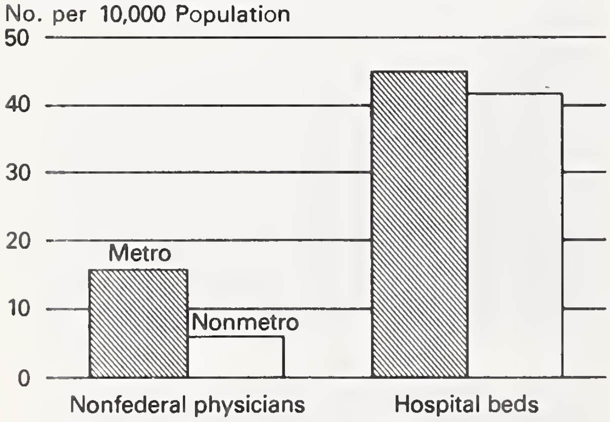
Rural Health Care

The use of national and regional averages has masked the real nature of rural problems. A study noted that to get better health care planning requires the consideration of smaller areas, more flexibility in regulations, adjustments in public funding formulas, and improvements in subarea councils.

The turnaround in rural-urban population migration has increased the strain on the health care system in nonmetro areas. Today, nonmetro areas have greater unmet health needs and fewer resources than metro areas. A comparison shows that they also have lower incomes, more elderly people, more hazardous occupations, and lower educational levels, all of which contribute to a generally poorer health status.

There were 71 nonfederal physicians per 100,000 population in nonmetro areas in 1975, compared with 157 in metro areas. The distribution of specialists was more uneven, with approximately three times as many medical specialists per capita in metro areas as in nonmetro areas. The 1969-73 infant mortality rate was 20.7 deaths per 1,000 live births in nonmetro areas, compared with 19.3 in metro areas. Totally rural areas are consistently found to have the lowest amounts of medical resources per capita and the highest infant mortality rate in the Nation.

Physicians and Hospital Beds



1976 data. Source: American Medical Association and American Hospital Association.

Rural household access to medical services in an eight-county, North Carolina area was compared with State and national health service data. In general, 90 percent of the households utilized the services of a general practitioner, 53 percent saw a medical specialist, and 63 percent visited a dentist at least once during 1974. A greater percentage of white and high-income households utilized these services than did minority or low-income households.

Persistent Low-Income Counties

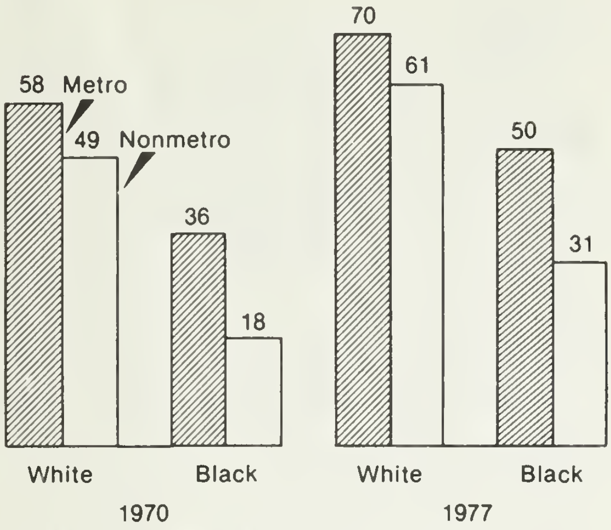
Forty-three counties had sufficient increased earnings from mining and agriculture to allow them to shed their persistent low-income status during the 1970-75 period. There had been 298 such counties as of 1969. The remaining 255 poor counties had fewer residents, showed a greater dependence upon proprietor's and transfer sources of income, relied upon agriculture for larger percentages of earnings and employment, experienced more severe conditions of social deprivation, had a relatively larger black population, and were highly rural. Most of these were in the South.

Rural and Farm Education

Rural public schools, with less revenue and support staff, are educating students who are more likely to enroll in school at a later age, complete fewer school years, score lower on national tests, and fail to attend college than city students. The percentages of farm residents completing high school increased between 1968 and 1975, but white farm males and females still trailed their urban counterparts by large margins. Differences in high school completion rates between urban and farm blacks actually widened during that period.

Adults Who have Graduated from High School

Percent



Adults are persons 25 years old and over. Source. U.S. Bureau of the Census.

Rural Credit

A study of home mortgages shows that credit is less available in rural than in urban areas. The major reason is the limited number of savings and loan institutions (S&L's) operating in rural areas. Farmers Home Administration (FmHA) loans helped to reduce the lending differential between the two areas, but not by much.

Households that received FmHA mortgage loans tended to have lower incomes and be headed by black or other minority females who had fewer years of schooling than did FHA or VA borrowers.

Nonmetro commercial banks are purchasing large numbers of municipal bonds issued by metropolitan governments. This has significantly reduced the availability of credit to the rural community. For 25 States analyzed, commercial banks in rural areas may have purchased as much as $1,932 million dollars worth of nonrural municipal debt instruments as of 1972. This sum represents nearly 3 percent of rural commercial bank deposits.

Issuing Municipal Bonds

A manual that gives an overview of how bonds of small local governments are issued, underwritten, marketed, and serviced was issued to help small communities with their financing. It distinguishes different purposes, and illustrates the effect of different repayment structures on interest costs.

Assistance for Cooperatives

Work in this area promotes knowledge of cooperative principles and practices as a means to increase family farm income. Program activities involve research and technical assistance to cooperatives and producers interested in marketing their farm products and purchasing their farm supplies cooperatively. Emphasis is placed on family farms and low-volume producers. Highlights of the accomplishments in this work are listed below.

Financial Profile

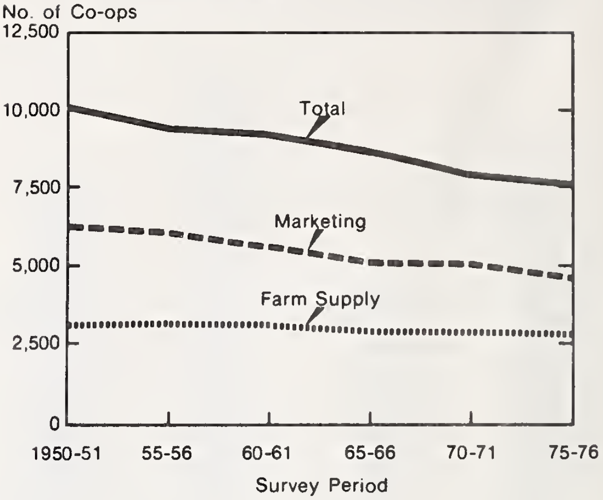
Farmer marketing and farm supply cooperatives had total assets of $18.5 billion in fiscal year 1976, of which member equities were $7.7 billion. Three-fourths of them had borrowed funds, and 62 percent of those funds outstanding were from the Banks for Cooperatives. Members' equity capital consisted of 49 percent qualified certificates of equity, 18 percent preferred stock, 16 percent unallocated reserves, and minor claims. Only 11 percent of members' equity was purchased by them; 77 percent came from retained patronage refunds, and 12 percent from capital retains. Most farmer cooperatives were small businesses; about two-thirds had assets of less than $5 million, and only 3 percent had assets of $25 million or more.

Cooperative Statistics

Statistical reports indicate that farmers owned 7,535 cooperatives in 1976, with membership of 5.9 million. Many cooperatives engaged in two or more services: 4,840 marketed farm products, 5,538 sold farm supplies and equipment, and 4,911 provided related services such as trucking, storing, and ginning. Their gross business totaled $55.9 billion in fiscal year 1976. Net volume, after excluding intercooperative volume, was $40.1 billion, with marketing of farm products accounting for $29.8 billion of this, farm supplies for $9.4 billion, and service receipts for $855 million.

The three States with the largest number of cooperatives were Minnesota with 1,048, North Dakota with 664, and Wisconsin with 494. The States with the largest cooperative dollar volume were California with $3.9 billion, Iowa with $3 billion, and Minnesota with $2.9 billion.

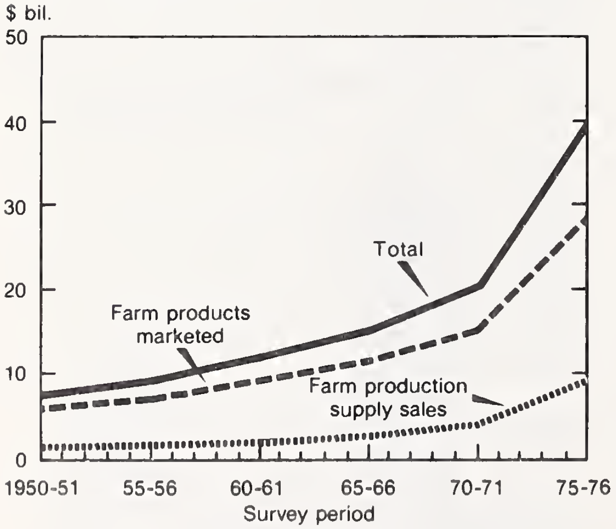
Number of Farmer Cooperatives in the United States



Teaching Materials

A series of educational materials on agricultural cooperatives was prepared for use by technical schools, institutes, and community and junior colleges. Many of the larger cooperatives now look to these institutions as a source of employees with business administration or agribusiness training. Materials were sent to 611 post secondary schools and 50 State heads of vocational agriculture at the request of the U.S. Office of Education. Copies also were sent to 40 State Councils and 72 State extension specialists working with cooperatives.

Business Volume of U.S. Farmer Cooperatives



The total business volume is based on net business, excludes intercooperative sales, but includes receipts for specialized services provided to members and patrons

Fruits, Vegetables, and Nuts

Farmers' 1976 cash receipts from fruits, vegetables, and tree nuts totaled about $8.8 billion. Growers of these products owned and operated 477 cooperatives that marketed about $3.4 billion of this produce. These associations in turn accounted for 4 percent of all marketing cooperative memberships, sold 11 percent of the value of all farm products marketed by cooperatives, and operated in 45 of the 50 States. The Pacific Coast States, led by California, accounted for 54 percent of dollar volume of all fruits, vegetables, and nuts marketed cooperatively.

Cooperative Development

Assistance is currently being provided to 27 new cooperatives. Most of these store or process vegetables, apples, olives, seafood, peanuts, or feeder pigs, or produce various crafts.

A feasibility study was done in South Carolina to determine if the modernization of processing and marketing facilities would help revive the shrimp operation in that area. It was revealed that with properly repaired boats, a cooperative could expect to harvest 120,000 pounds of shrimp in the first year, 320,000 pounds in the second, and 360,000 pounds in the third, and that this would be sufficient to ensure success.

A study was initiated at the request of producers of mountain trout to improve their market position. Producers were unable to meet the volume requirements of new markets outside their local area or to provide frozen fish. It was determined that a successful cooperative could be established by combining trout processing with the sale of trout feed. The volume of fish produced by the cooperative was estimated to be large enough to increase the potential for sales to large wholesale dealers and to institutions. The co-op will harvest the trout, provide freezer storage in slack times, custom process, and market them in western North Carolina, northern Georgia, and eastern Tennessee.

Challenges and Strategies

A comprehensive analysis of issues affecting cooperatives sorts out the crucial factors that will help cooperative leaders better evaluate the alternative strategies that can best serve the family farmer. The study assesses the social, political, scientific, economic, and competitive environment faced by cooperatives, brings together the thinking of cooperative leaders and academic people on current and future issues, presents alternative cooperative strategies and the means to accomplish them, orients farmers and cooperative leaders to the need for long-range planning, and projects the future for cooperatives over the next decade.

Piggybacking Fresh Vegetables

A study was done to determine alternatives for obtaining truck trailers to be used in possible rail piggyback service. It included an analysis of the organizational structure necessary to finance and operate a shipper-controlled program to transport produce from California to Midwestern and Northeastern markets. Results showed that in the study area, trucks accounted for more than two-thirds of the volume of shipments and 12 cities accounted for two-thirds of that. Receivers in these cities considered reliability of scheduled arrival time more important than speed alone. Most of them would welcome the opportunity to participate in a shipper-controlled supplemental piggyback program because this generally provided faster and more reliable service than refrigerated cars. Railroads were also receptive to the concept.

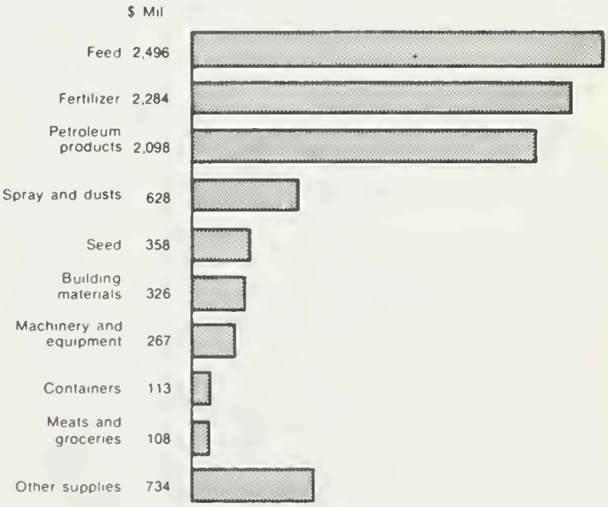
Grain and Oilseed Cooperatives

Assistance was provided to grain and oilseed cooperatives to help them cope with the problems associated with unit-train rates, car shortages, rail abandonments, elevator modernization and relocation, and rising costs. A circular was prepared that explains the characteristics and merits of seasonal pooling. Analysis of this problem is continuing.

Livestock Marketing

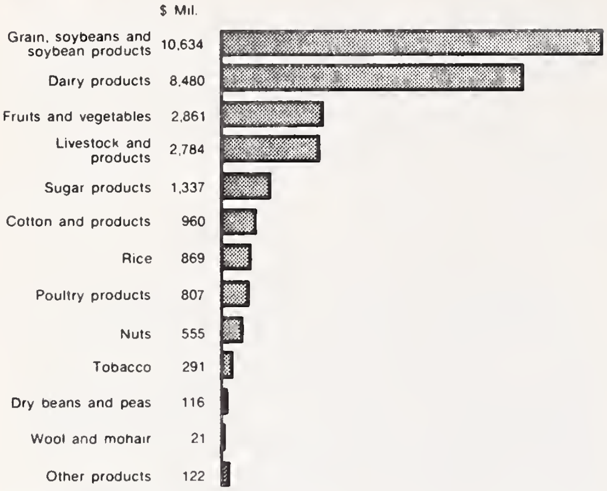
Continued declines in the open market and the loss of major packing plants has increasingly led cooperatives and producer groups to ask for assistance in evaluating producers' marketing alternatives. A study was conducted on the feasibility of pork producers to integrate into slaughter and processing as a longrun solution to their marketing problems.

Major Farm Supplies Handled by Cooperatives



Total Net Farm Supply Business = $9.4 billion Based on 1975-76 survey data

Major Farm Products Marketed by Cooperatives



Total net marketing business = $29.8 billion.
Based on 1975-76 survey data

Based on this and other studies, assistance was provided to cooperatives in the eastern Corn Belt and Arizona. Help was also given to a Wisconsin cooperative to improve its livestock marketing services to members.

Future Cooperative Dairy Structure

Research has shown that the structure of cooperative dairy marketing has changed significantly during the past decade. Recent projections show that by 1985: (1) the number of dairy cooperatives will decline to 300, a drop of 59 percent since 1973, (2) dairy cooperatives will market about 80 percent of all milk sold to plants and dealers, (3) raw whole milk will continue to be the largest single dairy product marketed by dairy cooperatives, and (4) many dairy cooperatives will find it necessary to greatly increase their scale of operations in order to provide the needed service to their growing number of customers.

Dairy Cooperative Coordination

A merger study of dairy cooperatives shows that coordination can provide these cooperatives with cost savings that can be returned to farmers as additional income. Another benefit for these cooperatives is a reduction in the use of scarce fuels by eliminating duplication of hauling routes and processing operations.

Impact of Cooperatives

The first of a series of studies on the effectiveness of cooperatives dealt with a highly integrated turkey cooperative, the Moroni Feed Company in central Utah. This organization was instrumental in helping farmers develop a new industry in face of the decline of sugar beets in the 1930's. It has been successful and now provides numerous services, including financing young farmers, processing, and marketing. Over 100 turkey producers now have an average equity of $87,500 in the cooperative, which has distributed about $30 million of patronage refunds to members since its organization.

Crop and Livestock Estimates

Statistical researchers and enumerators collect, analyze, and publish production and marketing data on agriculture, number of farms and acreage in farms; crop acreage, yields, production, stocks, value, and utilization, inventories and production of livestock, poultry, eggs, and dairy products; prices received by farmers for products, prices paid for commodities and services for living and production, and related price indexes; farm employment and wage rates; cold storage supplies; and other relevant aspects of the agricultural economy. The following are among the more significant accomplishments for the year.

Comparison of Sample Designs

A new handbook serves as supplementary training material on sampling for statisticians. It compares sampling errors for alternative sampling plans. Some comparisons of interest are the relationship between sampling errors for various commodities and proportions of farms producing commodities, the efficiency of the minor civil division in the sampling unit compared to the individual farm, the efficiency of geographic stratification related to the number of strata, and the efficiency of alternate allocations of a sample to strata.

December and June Enumerative Surveys

The December and June enumerative surveys are area-frame-based probability surveys that are conducted in the 48 contiguous States.

The December enumerative survey obtained information on livestock and poultry and on fall seedings of wheat and rye. The sample consisted of over 26,000 area tracts selected from the previous June enumerative survey and supplemented by a list sample of over 23,000 large livestock and poultry operators.

The June enumerative survey obtained information on planted and harvested acres of crops, land use, livestock, farm labor, farm grain stocks, and farm numbers. The area sample consisted of over 15,000 land segments and was supplemented with list samples of more than 10,000 large cattle operators and over 6,000 large hog operators.

These are the largest probability surveys conducted during the year, employing about 1,500 part-time enumerators. They also supply information requested by other agencies, such as data on the type of farm, hired agricultural labor, and grazing fees.

Area Frame Development and Maintenance

New area sampling frames stratified by current land usage were completed for Alabama, Louisiana, North Carolina, and Virginia. Replicated samples of land-area segments were selected from these frames and for Mississippi.

New land-use area frames were used for the first time in California, Georgia, New York, and South Carolina. Replicated samples of land-area segments were selected for all four States for the June Enumerative Survey. With the implementation of the new frames, 49 States (Alaska is excluded) now have area frames stratified according to land utilization. Of these, 26 have replicated sample designs for the June enumerative survey. All 49 States have replicated samples for use on economic type surveys.

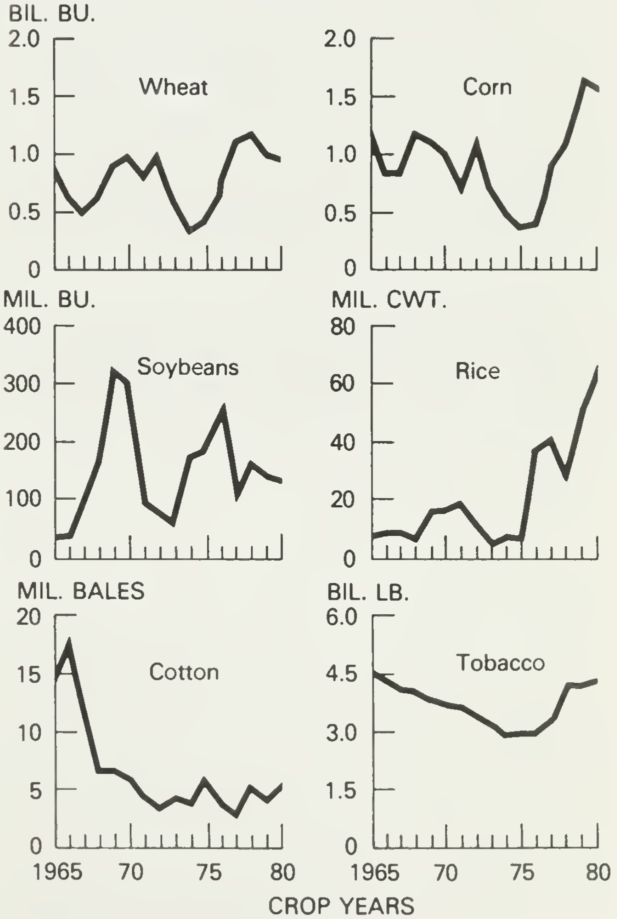
Marketing-Channel Survey

Data were published from a marketing-channel survey conducted in early 1978 to determine where producers sold selected farm commodities. Data were collected in 46 States and are being used to improve sample designs and allocations for the prices-received program.

Objective Yield Surveys

Objective yield surveys for wheat, cotton, corn, and soybeans were continued.

Stocks of Major Farm Commodities



Crop years beginning: Wheat July 1, 1960-64, June 1, 1965 to date; cotton and rice, August 1; soybeans, September 1; corn and other tobacco, October 1. 1980 forecast.

There were 17 States in the wheat program, with over 25,000 samples; 12 States for cotton, with nearly 24,000 samples; 18 States for corn, with 3,200 samples; and 17 States for soybeans, with approximately 2,000 samples.

About 700 enumerators with special training interviewed farm operators and made field counts and observations monthly through the growing season and harvested a sample of the mature crop. The survey concluded with post-harvest observations to determine harvesting losses. Results from these surveys were used as major indicators of yield. Enumerators also asked farmers the kind and application rate of fertilizer applied to wheat, cotton, corn, and soybean sample fields. Twelve of the States provided corn samples to the Northern Regional Research Center of USDA's Science and Education Administration (SEA) to determine the extent of aflatoxin.

Objective yield surveys were continued in 11 major fall-crop potato States which produce over 90 percent of the national crop. A total of 2,100 samples were assigned to these States to provide the primary yield indicator. Probability surveys also were conducted in these States to obtain primary indications of planted acreage.

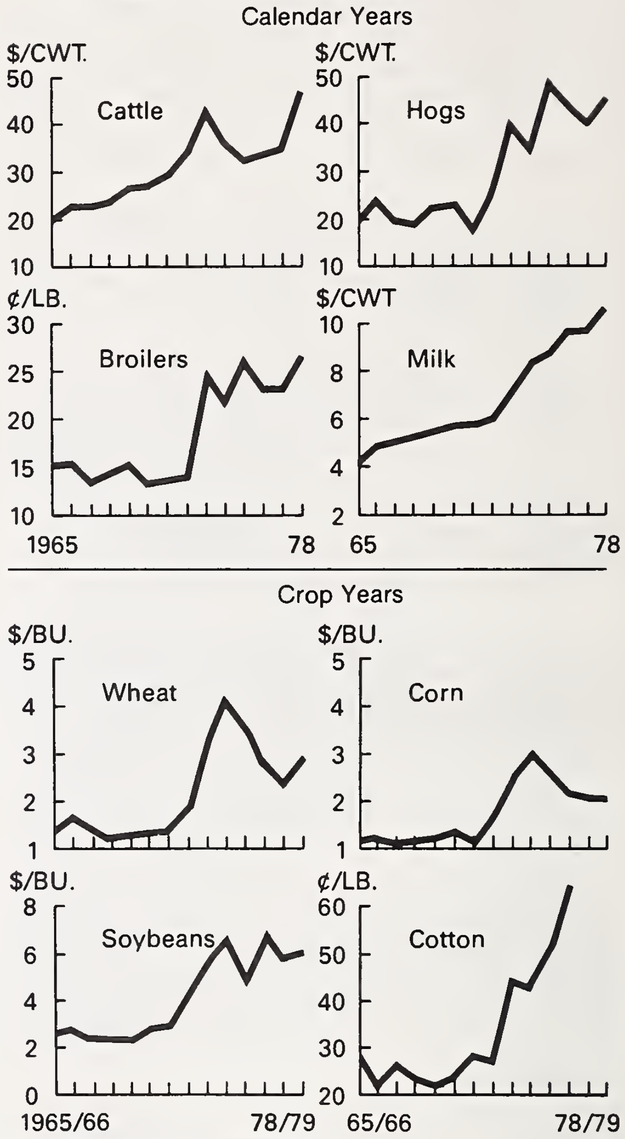
Supplemental funds for a tart-cherry objective yield survey in Michigan were again provided by that State's Department of Agriculture. Data were collected for the mid-June production forecast using a sample of 300 orchards; forecasts were updated and harvest losses determined.

Objective yield surveys were conducted for burley tobacco in Kentucky to verify indications obtained from mail surveys. Plant counts were made in 120 fields; the average weight of cured leaves per plant was obtained at time of stripping. Leaf count and measurement work also were conducted in a subset of 40 fields; data were used to forecast the crop.

White Corn Acreage and Production

White corn production forecasts and acreage estimates for Indiana, Iowa, and Kansas were reinstated for the 1979 crop year. A full program of estimates for all 10 States will be continued, with final estimates in the 1979 annual crop summary.

Prices Received by Farmers for Major Commodities



1978 and 1978/79 preliminary.

Vegetables

Processing estimates were included in the June annual summary; previously only fresh market vegetables were included. All estimates were brought together in one publication for the convenience of data users. Estimates were published for seven additional States that were previously combined in "other States."

Fruit Tree Surveys

Surveys to determine fruit tree inventories were conducted in Ohio, Tennessee, Colorado, Louisiana, New Mexico, Utah, Michigan, Idaho, South Carolina, and Pennsylvania as part of a rotational system established in fiscal year 1976. The States concerned provide financial support to conduct the surveys.

Floriculture

A floriculture survey conducted in early 1979 was redesigned in order to collect and publish data on total plants grown the past year for carnations, roses, and chrysanthemums, and on the gross area devoted to these plants.

Blueberries

End-of-season estimates were initiated in Maine, Michigan, New Jersey, North Carolina, and Oregon. Washington was the only State previously in the estimates program. Early season forecasts were started for all six States.

Potatoes

The potato estimating program was reviewed in depth during the year with the National Potato Council. As a result, May 1 estimates of stocks were made for the first time and will be continued each year. The first estimate of acreage planted and harvested was advanced to early July from early August. Information on harvest progress was published as of October 1 and November 1. Additional changes recommended by the Potato Council now under consideration include discontinuing the acreage intentions reports and initiating production and stocks estimates by type (red, white, and russet).

Seed Crop Estimates

The evaluation of statistical needs of the seed industry is continuing. Types and varieties of vegetable seeds included in the program were updated for the 1979 crop. Merion bluegrass is declining in popularity and has been combined with proprietary varieties; statistics for common and proprietary bluegrasses are now published separately and titled Kentucky Bluegrass Seed. Consideration is being given to the American Seed Trade Association request for a breakdown of perennial rye-grass into proprietary and common classes. If adopted, this change will be effective with the 1979 crop.

Prices Paid by Farmers for Seed

A summary of retail seed price statistics from 1962 through 1978 were published in the April and September issues of Agricultural Prices. These statistics supplement previously published prices from 1926 through 1961. Prices paid by farmers for 41 kinds, varieties, and species of seeds are included in the current bulletin. Some seeds were replaced by newer varieties during the period, and others were dropped from the estimating program.

Producer-Owned Grain Stored Off Farm

Information on the quantity of producer-owned grain stored off farm was collected in conjunction with the January 1, 1979, grain stocks survey. The information was used to determine the magnitude of grain moved off farm but still under the control of the producer.

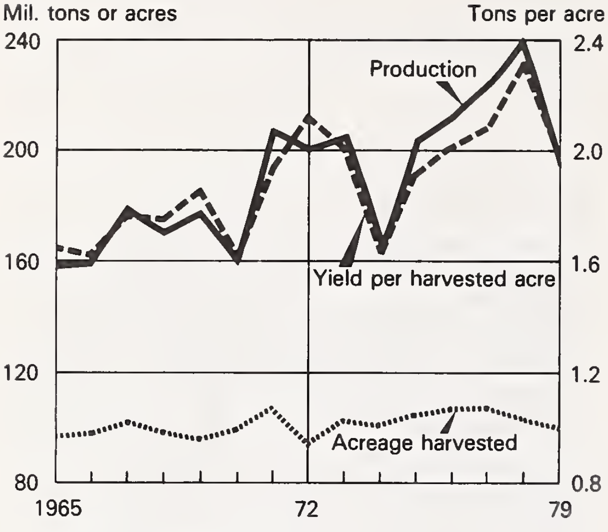
Interior Grain Market Survey

A new study addresses the reliability and effectiveness of present official inspection and weighing procedures in the interior United States and evaluates the operating procedures and management practices of agencies providing grain inspection services to the Federal Grain Inspection Service. Information was collected in 25 major grain States in the interior United States.

Weekly Weather and Crop Information

The national "Weekly Weather and Crop Bulletin," published in cooperation with the U.S. Department of Commerce, holds wide public interest because it relates to current conditions and progress of crops and helps bridge the gap between monthly crop data. Crop comments are supplied by the State statistical offices, and precipitation, temperatures, and other related weather information come from the

Feed Grain Acreage, Yield and Production



1979 based on August intentions.

National Oceanic and Atmospheric Administration. The weekly summary was further upgraded during the year by including additional information on weather and its impact on crop conditions and information on crop planting, harvesting progress, and other crop developments.

Livestock and Poultry Surveys

Emphasis on program improvements of multiple-frame surveys continued during the year. Multiple-frame surveys were conducted in all States: December 1 and June 1 for hogs, and January 1 and July 1 for cattle. In addition, 14 States were involved in the hog and pig inventory estimates for March 1 and September 1.

Multiple-frame surveys utilize two sampling frames: a list of farms stratified by size of operation, and the land-area frame used in the June and December enumerative surveys. The lists are updated annually from Federal, State, and industry sources prior to the selection of new samples. In list update activities, emphasis was placed on identification and separate stratification of dairy operations for use beginning with the January 1 cattle surveys. Virginia, Alabama, and Arkansas continued the multiple-frame approach in estimating inventories of chickens and layers.

Livestock Data Additions and Deletions

At the request of data users, a new series of data concerning percentage of operations by size group and the percentage of inventory in each size group was published beginning December 1978 in the annual inventory reports for hogs and pigs, cattle and calves, and milk cows.

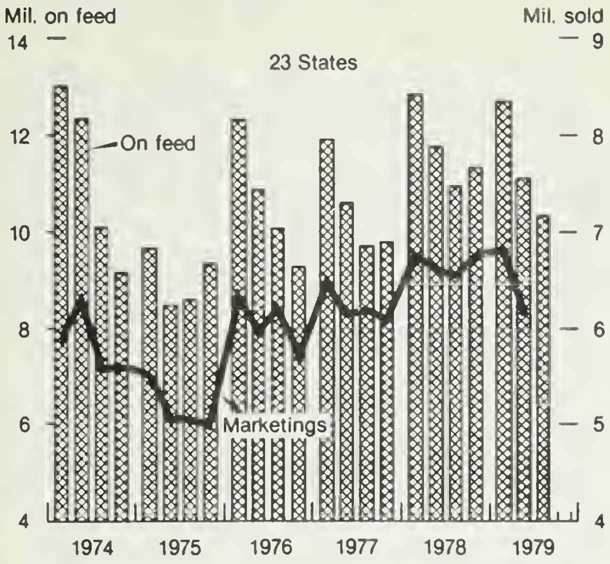
Balance sheets were developed at year's end for hogs and pigs, cattle and calves, and sheep and lambs. Similar data were provided at midyear for cattle. These series provide data users with preliminary supply and disposition information.

The terminology used to determine cattle on feed was modified to better define cattle and calves "on full feed" for slaughter market. This modification will assist respondents in reporting numbers actually on feed, as well as data users in evaluating and interpreting the cattle-on-feed estimates. The reference to "fattened" cattle was deleted in response to increasing consumer awareness of nutrition.

The sheep industry has been in a period of general decline over the past two decades. Program modifications were initiated to reduce respondent burden and survey costs by eliminating eight sheep-producing States with less than 5,000 head. The remaining States represent at least 95 percent of the total sheep population. Sheep inventory estimates were discontinued effective January 1, 1979, for Alabama, Arkansas, Delaware, Florida, Georgia, Mississippi, Rhode Island, and South Carolina. Separate sheep-on-feed estimates were discontinued effective January 1, 1979, in New York and Washington, which each had less than 10,000 head; however, these States will continue to provide estimates of all sheep.

Market Hog Weight Groups

Separate inventory estimates were discontinued effective December 1978 for the number of market hogs weighing over 220 pounds. This weight group is usually slaughtered between the data collection period and the release of the report.



Cattle on Feed and Marketings

Figures are million head, quarterly data.

Hogs in this weight group were combined with those in the group from 180 to 219 pounds, they will be reported and published as the 180-pound-and-over weight group. This change reduced respondent burden.

Price Index Studies

Agreements with the University of Minnesota were renewed to continue studying pricing, marketing, and prices-paid indexes. One study constructed prices-paid indexes, with weights related to crop costs of production. These were generally lower than the overall index during 1969-73 and above the overall index during 1974-77. A second study is analyzing changing agricultural marketing channels and the effect on price reporting and price indexes.

Rapid Data Transmission

Emphasis is still being placed on providing data to the news media and giving fast access to all users. Computer techniques have enabled dissemination of crop and livestock estimates to the 48 contiguous States within minutes after release time. User demand for continued expansion made the following reports available in 1979: crop production, U.S. grain stocks, milk production, cattle on feed, cattle inventory, hog-pig inventories, potato stocks, cotton ginnings, wheat and rye prospective plantings, weekly crop and weather summary, weekly broilers, weekly turkey hatch, weekly export sales, livestock slaughter, agricultural prices, vegetables, and summaries of economic situation reports.

List Frame Development

The use of computer programs is satisfying three major requirements: the design and implementation of efficient procedures to delete duplications when names of farm operators are obtained from more than one source, better methods of updating names and addresses to keep the list current, and faster sample-selection procedures.

Research for Improved Forecasts

This work is aimed at providing better forecasts in unusual years by developing within-season crop growth models.

A 1978 Kansas wheat research study indicated the model developed had a limited ability to make timely and accurate forecasts for fields selected for the study and identified an overestimation problem relative to the check data. Various modifications are now being tested in cooperation with Kansas State University. The 1978 Missouri corn and soybean yield research project is testing various ways of combining information on soil moisture, weather, and field practices. It is also evaluating more cost-effective applications of the corn-growth model.

Remote Sensing and Yield Estimates

Tests are being done to determine if remote sensing by satellite will help in estimating crop yields. Initial tests on corn and soybean fields in Iowa indicate that by using satellite data, ground yield observations can be generalized for larger areas and that larger area yield estimates can be provided by using relatively few ground observations. The 1979 Missouri corn and soybean study will also be utilized for this purpose. It will concentrate on comparisons between satellite imagery and crop conditions on the same date and between preharvest crop conditions and final yield.

Alternative Objective Yield Methods

Alternative ways of obtaining objective soybean yield data were evaluated in Illinois to improve the accuracy of soybean-yield forecasts. Preliminary results indicate that current procedures produced lower counts than new ones tested and that the differences usually became greater as the season progressed.

The 1978 Iowa State soybean development and yield study, designed to reflect both the vegetative and reproductive development of soybean plants in an objective and repeatable manner, was modified for further evaluation in 1979. A similar soybean objective-yield-research study was conducted in 1979 in all regular soybean objective-yield-sample fields in Arkansas, Illinois, and Ohio.

Weather Yield Models

The 1979 Kansas State wheat objective yield modeling study was used to collect plant material that would provide measurements of leaf area and plant biomass to evaluate weather-yield models. Clipping began in late March for the approximately 70 samples and continued until harvest.

Work on the Leeper corn-yield model, initiated in 1977, was continued as part of the 1979 Missouri cooperative research agreement for a corn and soybean yield research study. The model was tested for six Corn Belt States. The 1979 study utilized the probability sample to make inferences about the three northern Missouri crop-reporting districts and compare the results of the model at a substate level. The same study also provided the Soil Conservation Service with necessary data for both corn and soybeans to support further work on its crop water-stress model and the crop moisture-stress index.

The 1978 Mississippi cotton yield and simulation study was conducted to provide data for testing a cotton-yield management model (GOSSYM). This model is among the most detailed weather and physiological variable models currently available. Its results will be compared with actual observed conditions. At the same time, the data collection procedures needed for such a complex model will be tested.

The 1978-79 tristate winter wheat study was conducted to provide data for a cooperative research study with Texas A&M's Blackland Research Center to test and evaluate a full-season wheat crop-weather model.

A procedure has been developed and is being refined to generate, through computer simulation techniques, sequences of daily weather data designed to reflect the central tendency and variability of weather and to reflect temporal similarities.

Remote Sensing and Acreage Estimates

A 1979 study in Iowa showed that satellite data could be used to help set Iowa estimates for crop reporting districts and would be useful once LANDSAT data are available in a dependable time frame (14 days).

Other research continued in 1979 to improve LANDSAT capabilities. For example, in some areas, trees are confused with spring planted crops in August and September imagery, but it was found that spring imagery could significantly improve these results. Research is also being conducted in an arid environment to study rangeland conditions.

Fuelwood, Fenceposts, and Timber Products

Data were obtained at the request of the Forest Service to determine the amount and kinds of roundwood used the previous year for fuel, fenceposts, and miscellaneous timber products in Montana, Utah, Ohio, South Dakota, Michigan, and Florida. The survey was combined with the regular June enumerative survey in the six States.

A Look Ahead

The ESCS research and data program of the eighties will be determined by the needs of public and private decisionmakers as these needs are influenced by the changing U.S. and world environment.

Forces affecting U.S. agriculture, the food system, natural resource use, and rural areas are changing and continue to become more complex and more interrelated.

There have been fundamental changes in the structure of U.S. agriculture. The number of farms has declined rapidly, the average farm size has increased, only a third of the farms account for most of all farm receipts, capital requirements limit entry into farming, ownership is becoming concentrated in the hands of nonoperators, and Federal assistance programs largely miss their intended targets.

At the same time, domestic concerns are shifting from the quantity of food to price, safety, quality, and nutrition. Resources are mostly limited, and abuses to the environment can cause costly, dangerous, and often irreversible consequences from the increased use of chemicals, the population-induced conversion of farmland for development, and the pollution and depletion of water and land.

The migration back to the countryside from urban areas has renewed attention to rural development and the quality of life in rural areas. Communities, which for many years had to adjust to a shrinking population, now are faced with finding ways to finance and provide services to an influx of new residents. Poverty still persists in some rural regions of the country, and many areas lack educational opportunities, training programs, and adequate health care. And the economic well-being and performance of small farmers remain largely unknown.

These changes form a large part of the basis for the ESCS program of the future. Some redirection has already started, but more updating, strengthening, and adapting will be made as resources and circumstances permit.

Domestic Food and Agriculture

Effective public policies and programs for food and agriculture continue to require dependable economic intelligence about current and likely financial well-being of producers and the economic health and performance of the farm production and marketing sectors. Most of the indicators of economic well-being (farm income accounts and the balance sheet of the farm sector) and the conceptual and data systems supporting these measures were designed for an earlier time.

A new set of accounts and indicators needs to be developed to measure the aggregate level and distribution of farm income, farm wealth, financial health and viability of the sector and of major groups of farmers, and the income to farm families from all sources. These must be consistent with the National Income Accounts maintained by the U.S. Department of Commerce for the general economy, they must permit comparisons of the economic well-being of farmers with the nonfarm economy, and they should make it possible to compare well-being among farmers by geographic region, type of commodity, size of farm, tenure arrangement, and financial equity. Such measures will help to identify the causes of structural change, the viability of family farms, and the effectiveness of alternative policies in achieving economic, financial, and distributional goals of national policy.

Changes in the farm sector have been accompanied by--and perhaps partly caused by--changes in the marketing of farm products. The producer (first handler) markets that once clearly separated production and processing no longer exist. For some commodities, the two have become so integrated that all semblance of competitive markets has disappeared and nonintegrated producers are losing access to markets. In addition, futures markets have grown in importance relative to cash markets, and their role and influence on cash markets is an increasingly important question.

Food consumption patterns have not escaped change. Changing societal values, growing understanding of the role of women, and an increased demand for leisure have brought about changes in the tastes and preferences for food. A significant change is the growing service element of total food expenditures which, along with rising costs, has caused a substantial decline in the value of commodities at the farm gate. In addition, determining the likely impacts of policy options to resolve food safety, quality, and nutritional issues will be crucial to improved decisionmaking over the next several years.

Emphasis for 1980

Several adaptations to the foregoing needs are planned for implementation this year. The following are among the more significant.

Structure and performance.--An improved comprehensive set of U.S. and State estimates of farmers' cash receipts, production expenses, and net income from production will be implemented and maintained to get better indications of farm efficiency and well-being. Analyses of assets and debts of the farm sector and of agricultural productivity will be continued and improved. Farm income will be analyzed by sales class and type of farm. Changes in current farm income will be forecast quarterly and annually.

Compilation and evaluation of basic changes in economic indicators of the food marketing system--the market basket of farm foods, price spreads, and marketing costs--will be continued, and an improved marketing cost index will be developed and maintained. New studies will identify, describe, and analyze the structure and organization of agriculture and adjustment problems in the farm sector, with some emphasis on small farms. These include the effects of inflation, economics of farm growth and size, and government policies on the control of agriculture. The status of technological progress will be identified, and its impacts on rural income, employment, energy use, and food prices will be evaluated.

Energy use in the food and fiber sector will be estimated, impacts of price changes and availability will be assessed, and research will be done on use, costs and returns, industry structure, and policy implications for such major farm inputs as farm machinery, pesticides, and fertilizers. The potentials will be determined for energy conservation and substitution of direct solar and other renewable energy resources. The feasibility and impacts of using agricultural resources for energy production will be analyzed.

Cooperative issues.--A national cooperative training center is being planned to provide training and education in the organization and development of new and merging cooperatives. The training will be aimed at directors of cooperative boards, their management staffs, and members to improve performance in their respective roles. It will involve a team effort in teachings in cooperative management of finances and personnel by drawing on expertise from successful cooperatives, universities, Federal and State agencies, the Farm Credit Administration, the Farmers Home Administration, banks, consulting firms, national cooperative organizations, and others.

Three or four field offices, in addition to the two already established, will be set up in areas where the workload for assistance in the development of cooperatives is the greatest. The field specialists will work with emerging and ongoing cooperatives in need of specialized technical assistance in management, marketing, financing, and member/board relations, and will work closely with other appropriate Federal, State, and local agencies.

Several special projects are being initiated, including: research in oilseeds to identify alternative strategies cooperatives might employ to best represent the interest of their farm members in light of problems, trends, and opportunities in the oilseed industry; a feed industry study on the future role of cooperatives in the face of increased onfarm mixing, escalated transportation costs, and shifts in the location of livestock production; a study to examine the experience of cooperatives in using industrial development or revenue bonds to finance new or expanded facilities; and a study on the extent to which federations of marketing agencies (authorized in the Capper-Volstead Act) are used and their roles among agricultural cooperatives.

Supply, demand, and price.--Changes in food prices will be monitored and analyzed to determine reasons for change, assess the effects of the changing market structure on food prices, and assess the effects of government policies on the prices of agricultural products and food.

New and improved methods of forecasting demand, supply, and price of farm commodities will be tested to support outlook work, and improvements will be made in the acquisition, handling, and storage of data. The results of analyses and forecasts for the farm sector, food prices, and the outlook for commodities are made public through the national outlook conference and various publications.

Farmers' newsletters have been successful in terms of their distribution. The volume is expected to reach 3.3 million by the end of this year. An evaluation will be completed to determine if the newsletters are achieving their objectives and how they might be improved.

Food and nutrition.--Factors influencing expenditures for food--income, age, sex, ethnic background, family composition, geographic area, food program participation, and residential location--will be assessed, as will the consequences of consumers' food choices on nutrition.

Other current and emerging food and nutrition economic issues to be investigated include: the implications of changing food prices; the impacts of changes in food industry structure and performance; the extent of direct marketing and its impact on farm family income; and the impacts of public food assistance programs on recipients, marketers, and producers of agricultural commodities.

Research on food safety and quality will include the economic implications of alternate procedures to control sulfa residues in swine products, development of methods to assess the impacts of regulations concerning induced technology (such as insecticides), and the benefits from more extensive and accurate food label information.

Agricultural and food policy.--Economic analysis will be provided on agricultural policy issues related to commodity programs, and their effects on farmers and consumers and on different parts of the country. These will serve as a basis for deciding proposals for 1981 farm legislation, and will emphasize producer response and adjustment for crops and livestock to policy inducements and mandates.

The increasing interdependence between the agricultural sector and the rest of the U.S. economy and between the United States and other nations will receive special attention to serve the needs of domestic farm policy formulation.

A broad spectrum of new work will include an assessment of: the impacts of Federal and State regulations, transportation deregulation, and the role of marketing orders; the economic impact of new technological approaches for meeting the new cotton dust standards; economic evaluation of alternative boll weevil programs; the impact of marketing up to 20 percent of the burley tobacco crop in bales; the impact of eliminating or modifying Federal milk marketing orders; the nature and causes of the cattle cycle and management of beef cow enterprises, the impact of milk price support programs and component pricing of milk, and means of improving poultry and egg pricing systems.

Agricultural statistics.--Critical to developing information and monitoring the rapidly changing food and agricultural system is the maintenance of up-to-date statistics on crops and livestock. To ensure quality information, regular reviews and user consultation will be continued to see that the data are collected and issued in an efficient manner and satisfies user needs. Efforts continue to ensure that the time between data collection and release is minimized, that information distribution is improved, and that the response burden on individuals contacted in surveys is reduced as much as possible.

Plans for this year are to expand user consultations from two to four regional meetings. These meetings solicit views on data and comments on the outlook and situation information that is provided by USDA.

A program initiated in fiscal year 1977 to improve the reliability of prices received and paid by farmers is entering the final stage. The main thrust of this effort has been to convert to a probability basis the estimates of prices received for all major crops, livestock, dairy, and poultry, and for prices paid for major production items, including fertilizers, feed, fuel, and repairs.

A major part of the remote sensing project in 1980 is the utilization of LANDSAT data to improve current estimates of wheat in Kansas and corn and soybeans in Iowa. A second feature of the work in Kansas will be an examination of land cover estimates which will include such items as rangeland, woodland, cropland, and urban areas. Specific additional ground data will be collected to study the land cover and LANDSAT image relationships. Research efforts are planned in California and in the Red River Valley to study crop estimate situations that have not been attempted in earlier major crop efforts.

Considerable emphasis will be placed on getting improvements in registering satellite data for actual ground locations, improving the classification of crop or land cover types, and effecting better data-handling capabilities. The program also involves research into procedures for developing early warning capabilities for detecting crop stresses and being able to estimate crop acreages in foreign countries.

Minor changes are being made in vegetable data to reduce the reporting of those not widely used. These include eliminating March acreage intentions for processing vegetables; acreage intentions for onions in January, March, and October, monthly celery estimates of plantings in Florida, California, New York, and Michigan; all celery estimates for Washington; estimates of fresh market tomatoes in Kentucky; production, farm disposition, value, stocks, and utilization of Irish potatoes in nine minor producing States; estimates of production, farm disposition, value, and stocks of sweetpotatoes for two minor producing States; one annual revision on sweetpotatoes and summer potatoes; and within-State estimates in Oregon and Idaho.

Directions for 1981 and Beyond

For the longer term, there will be a need to follow through on several of the expansions and improvements started this year. It will also be necessary to begin on some additional initiatives if the food and fiber sector is to be supplied with essential information for making decisions. The following are some of the high priority areas of work.

Measures of farmers' performance and well-being.--Reducing conflicting views and confusion about the economic performance of the farm economy and improving the outmoded and inadequate measures of farm well-being will require the following work:

--developing and implementing to a greater degree appropriate concepts of farm income, farm productivity, cost of production, financial condition and other measures by farm size, commodity produced, tenure arrangement, and geographic region,

--developing a data base to undergird the new measures outlined, and

--researching and analyzing new studies based on the new data and measures, with focus on an improved explanation of the economic condition and prospects for various groups of farms, including small farms, and an understanding of the implications for future structure, organization, and performance of the farm sector and how all this relates to effective public policy.

Cooperative policy issues.--Problems of inflation, energy, transportation, finance, regulation, taxation, antitrust, market orders, and others have heightened the policy debate concerning cooperatives and their impact. These concerns are likely to continue well into the eighties, and will require the development of the analytical capability and data base for a more timely and complete response to the issues. These might include:

--analyzing the impact of various Federal tax and regulatory programs on cooperative growth and development,

--determining in the context of agricultural markets the extent to which cooperatives can obtain and exercise market power,

--comparing the performance of cooperatives and non-cooperatives in their service to farmers and the impact of their activities on the total agricultural production and marketing system,

--developing and maintaining a data base from which information can be drawn to answer a variety of questions about cooperatives, including their growth, market position, power, and performance, and

--improving the financial management of cooperatives by analyzing factors influencing individual cooperative growth, capital needs, and access to financial markets, by developing comparative performance standards and financial analyses and procedures for long-range planning for medium to smaller sized cooperatives, and by developing training and educational programs to help officials more effectively acquire and use the financial resources of their cooperatives.

Food marketing and nutrition.--Recent studies have clearly shown the need for further research on the relationship between the food delivery system and consumer food choices, and on the role of food industry merchandising practices, food and nutrition information programs, and the changing number and size of firms on consumer food prices. The more immediate needs include:

--conceptualizing and developing a substantially improved system of food sector accounts to monitor and analyze margins, marketing costs, food prices, expenditures, and consumption,

--initiating a program of studies on the effects of changes in commodity and food pricing systems, the relationship between pricing policies and changes in the industrial organization of the food system, and the causes and consequences of declining productivity in the food sector, and

--initiating a series of studies to assess the food price and consumption impacts of public and private food and nutrition information programs, including the effects of grades, standards, labeling, nutritional data, and advertising.

Farm needs for energy.--Information on the consumption and use of gasoline, diesel, liquified petroleum gas, and natural gas by farmers is obsolete. New and up-to-date data on regional use, farm storage capacity, and use by type of equipment is needed for proper planning. Energy production from agricultural products and waste has the potential to compete for supplies of farm commodities (which would increase food prices), but little is known about its feasibility or extent. There are many energy-related problems to be addressed, for example, major brand suppliers are reported to be withdrawing from rural areas which now must draw a larger portion of their supply from independents and cooperatives. The effects of this are not known. Other issues relate to the development of coal and oil shale resources which threaten the environment and the water available for agriculture and rural communities. Immediate needs are:

--conducting surveys to complement census of agriculture surveys on energy-using equipment and storage capacities, and providing new information on energy use, supplies, and price,

--analyzing the impacts of energy shortages and higher prices on such vital activities as crop production, crop drying, irrigation, and transportation, and on interregional competition,

--evaluating the impact of farm sector energy production on farm incomes, rural welfare, and food prices, and

--studying energy policy as related to the competitive position of cooperatives, to the environment, and to rural communities.

International Trade and Development

A major change in this decade for agriculture and the Nation has been the expanded importance of international markets for agricultural commodities. The United States has comparative advantage in the production of many food products, but expanded agricultural trade does not come without its costs in terms of instability from international weather patterns and from the erratic policy changes by the trading nations of the world.

This poses new information requirements; namely, information on the food and agricultural economies of other countries and information on the interrelationships among countries and among economic and political blocs. This information is needed to assess longer term trade prospects and the potential U.S. commitment to humanitarian and development goals.

Emphasis for 1980

Increased emphasis will be placed on improving the outlook for trade through studies on countries and regions to seek more effective U.S. export strategies, research on the impact of foreign economic growth on international trade, and research to develop more accurate and comprehensive data on agricultural resource use and development opportunities in foreign countries.

In this framework, multicountry projections are being planned of world and regional production, consumption, stocks, trade, and prices for major agricultural commodities over the next 5 years. Studies to estimate the potential foreign demand for U.S. farm products will be carried out in critical areas, including the Arab OPEC countries and Nigeria. The enlargement of the European Community and its impact on trade in feed, livestock, fruits, vegetables, cotton, and tobacco also will be examined.

Research is needed to assess future U.S. transportation system needs to support rising farm export levels in the near and medium future. Knowledge is also needed of transportation systems in the the major competing countries. As a start, the Canadian transportation system is being studied--with special attention given to conditions in western Canada--to assess that country's grain exporting capacity.

To support the upcoming debate on a new farm bill, there is a need for research on the influence of U.S. commodity loan rates upon the price for U.S. agricultural commodity exports--particularly wheat and feed grains--and to determine the impact upon the competitive position of the United States in specific foreign regional markets.

Directions for 1981 and Beyond

The most critical data and research needs are predicated upon a better understanding of the economics of the foreign countries that are key to the agricultural trade of the United States. With few exceptions, very little is known about the foreign demand for U.S. products, what drives it, and how it can be influenced. Such key structural elements as past capacities, transportation systems, competition and its regulation, farm and consumer programs, institutional development, and such factors as exchange rates, monetary and fiscal policies, and energy prices that hinder or enhance foreign trade are also unknown.

Information also needs to be updated on countries where some knowledge exists of these structural elements because they continually change. Thus, a study is needed for a broad cross-section of countries of the basic relationships that influence economic development and agricultural trade that are fundamentally different today than they were before 1971.

There is also a special need for information to direct foreign assistance and market development related activities. This suggests the need for a comparative study of the effects of foreign economic trade development on U.S. agricultural trade.

Remote sensing can provide significant improvement in the Department's current information system for domestic and foreign situations. A continuing research program is needed to: develop additional crop yield forecast models; join with other institutions in identifying basic environmental variables that affect plant growth processes; institute a remote sensing program; develop area sampling frames for foreign countries included in the joint research program; test pilot techniques and procedures developed using LANDSAT data; and improve techniques for data registration and classification.

Along with these is a need to develop a modern land resource inventory of the world and conceptual framework for developing an automated inventory of agricultural resources in the developing countries.

Natural Resources and Economic Development

Water shortages, rising energy prices, loss of agriculture land to urban growth, uncertainty about future agricultural technology, and impacts of agricultural pollutants on the environment are current concerns of both the public and elected officials. Attention and debate is being focused more than ever before on how land and water conservation programs can be formulated to ensure long-term productivity and enhance environmental quality. Water conservation is the cornerstone of the President's water policy, and control of agricultural runoff and nonpoint pollutants is a major thrust of environmental policy. Federal, State, and local government programs designed to address these problems will significantly affect farmers and rural communities.

Many rural areas have experienced a turnaround in population trends and are now growing again. Almost 9 out of 10 rural residents are not farmers, but little is known about these people, or about those who are moving into rural communities, those who are staying, or those who have moved out. Little is known about what is happening to the rural labor force, how far people are commuting, the impacts on local government services and finance, or the impacts of Federal expenditues on local areas. Information on these and related items is needed to provide guidance about the implications of the changes in population for rural development policies.

Rural people have always had special problems of access to health, education, and various other services. Rural local governments, because of their small size, will have problems in satisfying those needs. Information is inadequate as to where these problems are particularly serious and what types of innovative solutions may exist.

The plight of America's farm workers has been one of the Nation's most serious and persistent economic problems. Low incomes, high unemployment, low education, poor housing, and other problems persist among farm workers in spite of State and Federal legislation and the best efforts of many social welfare agencies.

Statistics have been available on a variety of characteristics of rural areas, from incomes to health to housing quality, but these statistics were collected for purposes other than to analyze the problems now faced in rural areas. There is no way to relate the statistics to the problems, so it has not been possible to help policymakers establish priorities on which problems to attack first.

There is mounting concern that the cropland shifting out of food and fiber production in urban areas, particularly the Northeast and in much of the Southeast, is permanently lost to agriculture. There is no data to indicate what this is costing or if it would be feasible to return these areas to crop production.

Cropland acreages, fertilizer use, and chemical use will be affected by measures to conserve natural resources and improve environmental quality. Major changes in production inputs, cultivation practices, and management will be required if farmers are to reduce sediment and other nonpoint pollutants. But little is known about the price and cost at which widespread changes in agricultural practices will come or if resource owners can achieve environmental quality objectives and still produce adequate supplies of food and fiber, recreation, and esthetic surroundings.

Multiple use of land and water resources must conform to their economic and physical capacities, but resource use plans must be developed in the context of community and farm needs. Without full recognition of these interactions, any plan is likely to fall short of being fully effective.

Emphasis for 1980

The apparent need for a more completely interactive information system for agriculture, resources, and rural development suggests that the following high priority work move in that direction.

Rural development.--Additional emphasis will be provided to clarify the issues concerning the 2 million or so small farms in rural America. A prerequisite to this is a better understanding of the attributes of small-farm operator families, the characteristics of their farming operations, their objectives and goals, their needs for community services, and other information regarding their well-being. This research will be supported by extensive use of existing data, but some new data in select areas will be obtained to determine the type of help, if any, that would be most effective for families on small farms to improve their well-being.

The creation of new employment opportunities needs to be supported by studies to examine the effects of employment and income growth on various populations in rural areas. A prototype is now being conducted in nine southern counties with a broad manufacturing base that is typical of the situation in many fast-growing areas.

Despite well-developed national money markets, very little is known about how well they operate to support rural areas. Studies are needed to investigate whether Federal Reserve open market operations and discount rate policies impact differently on income and employment growth among regions of the country and between metro and nonmetro areas. This is in addition to exploring the feasibility of alternative means for rural people and communities to better tap these markets.

A study in Missouri and Oklahoma will assist rural community leaders, citizen groups, and local government officials in dealing with problems of rural growth and development. This is part of a technical assistance effort in which agency personnel will serve as resource persons in cooperation with extension services and community development specialists of the respective universities. The topics to be dealt with include the need and costs of nursing homes, solid waste collection and disposal, rural water and sewer systems, and rural fire protection.

Natural resource conservation and management.--USDA is cooperating with the U.S. Department of the Interior in preparing an environmental impact statement on proposed reclamation regulations for enforcing the 160-acre limitation laws. The study, while specifically addressing the enforcement of proposed rules, will also provide data and analysis useful for dealing with questions on farm investment and economies of size, as well as the rules' impacts on communities and regions.

Reports are planned that will present regional and State information from the U.S. landownership survey conducted last year. These will include data on owner occupation, race, age, sex, education, residence, and how and when land was acquired. Special summaries are planned on land purchases and sales, conservation and irrigation investment, changes in the cropland base, and land clearing and drainage.

A study of the future viability of agriculture in Massachusetts is underway, with participation by the Soil Conservation Service, the Forest Service, and the Massachusetts Agricultural Experiment Station. It is designed to determine the levels of farm production needed to sustain farm income and farm marketing and supply services in that State.

Work has begun on a statewide study of land and water in Arizona to help plan the use of the State's water resources and reduce groundwater depletion while meeting increasing demand for water in nonfarm uses. In addition, an analysis of the economic impacts of adopting improved irrigation practices to achieve water and/or energy conservation has been expanded from a one-State pilot study to include the entire Northern Great Plains, the analysis of water application and crop yield information in Arizona was expanded to cover eight Western States; and a new study is being initiated in California and Colorado to examine water leasing, water pricing, and other quasi-market arrangements for short-term reallocations of water to minimize drought impacts.

Environmental quality.--Work has been initiated to estimate the economic feasibility of pest management methods and systems developed for the control of 20 different pests or pest complexes affecting the production of 15 different agricultural commodities. This includes estimating the value of early season soybean insect predictions, analyzing alternative methods for controlling the citrus thrip and citrus pest complexes, evaluating the use of Nosema locustae, a protozoan pathogen, to control grasshopper populations, comparing costs of chemical, biological, and cultural methods for livestock fly-pest management, and evaluating incentives needed to encourage wider adoption of the integrated pest management approach.

Determining the economic importance of individual pesticides continues in response to the Environmental Protection Agency's pesticide re-registration process. Work will be initiated on a number of pesticides, including captan, EPN, silvex, PCNB, triallate, and carbaryl.

Boll weevil eradication and optimum pest management trials were started in the 1978 crop year; the former in North Carolina, and the latter in Mississippi. Work continues on the evaluation of these trials, which will be terminated in 1980.

Directions for 1981 and Beyond

A fundamental long-term need is the development of a comprehensive information system for resources and rural areas. The foundation for such a system lies in establishing a statistical base that measures all essential variables reliably, accurately, and regularly. Monitoring these variables for indications of problems and issues would be impossible without this data base, as would any research or analyses that are meaningful to the public and to public decisionmakers.

There presently is only a limited capability for generating this type of data, and much of it is done on an ad hoc basis and for limited purposes. Most of the research and monitoring that is done relies on resources and socioeconomic data provided by such sources as USDA's Soil Conservation Service, the U.S. Geological Survey, and the U.S. Departments of Labor, Housing and Urban Development, Health, Education, and Welfare, and Commerce. These sources are useful, but they are less than fully satisfactory for supporting the needs for economic analysis. Any new information system should include a data base that complements these sources of available data.

A new information system must include data to periodically identify where rural residents are located, their incomes and employment, and the problems they face in obtaining adequate housing, health, education, security, and other public services. It must also monitor developments and trends in rural business, rural credit, environmental practices, the condition and ownership of land, resource inventories, and other factors. More specifically, some of the high priority components of a regularized data system would include surveys:

--of rural households in major labor-using States to determine the status of hired farm workers, the duration of farm work, type of farm work, earnings, family income, migrant status, demographic characteristics, labor force participation, commuting practices, sources of income, public service demands, community facilities, government financing, relocation and migration patterns, and well-being with respect to housing, community services, residential preferences, and employment opportunities,

--of farmers to assess the cost and benefits of alternative pollution abatement practices, including data on costs, participation rates, site and off-site impacts, and potential improvements in water quality,

--of landowners to determine type of ownership, tenure, absenteeism, recording practices, transfer rules, land values, tax rates, land use controls, attitudes and characteristics, purchases, sales, abandonment, prices, and values, and

--of households, farmers, and municipalities to determine water sources and use, development costs of surface and groundwater for irrigation, and water conservation costs for practices and impoundments.

Publications and Services

ESCS issues hundreds of reports, newsletters, and bulletins each year on the latest agricultural and rural research. Subscriptions to the major periodicals listed below are available through the Superintendent of Documents, U.S. Government Printing Office (GPO), Washington, D.C. 20402.

The monthly FARMER COOPERATIVES magazine features articles about farmer cooperative technical and research projects and examines current cooperative issues. Free to cooperative members and others working directly with cooperatives; others may subscribe through GPO at the above address ($10 per year; $12.50 foreign).

AGRICULTURAL OUTLOOK brings together the outlook for food and agriculture, including sections related to commodities, food, marketing, world agriculture and trade, and farm income. The monthly report updates commodity, food, and situation reports, and features current data on farm income, prices, production, and general economic indicators. Annual subscriptions are available ($19 domestic; $23.75 foreign) from GPO.

AGRICULTURAL ECONOMICS RESEARCH, a technical quarterly featuring articles on methods and findings of research in agricultural economics, includes reports on work in progress and articles on research methods and new areas of study. Subscriptions are available ($6.50 domestic; $8.25 foreign) from GPO.

FARMLINE, a new ESCS news-style magazine, presents current research, economic, and statistical information complete with full-color charts and graphs. FARMLINE is published 11 times a year. Send requests for subscriptions to: ESCS Information, Room 340-GHI, USDA, Washington, D.C. 20250. (Subscription cost not available.)

WEEKLY WEATHER AND CROP BULLETIN summarizes the previous week's weather and its effects on crops and farm progress for each State. Order through the Agricultural Weather Facility, Room 3526-South, USDA, Washington, D.C. 20250; $13 annually.

The following reports are available from ESCS Information, Room 0054-South, USDA, Washington, D.C. 20250, or as otherwise indicated.

OUTLOOK AND SITUATION REPORTS for individual commodities are issued throughout a crop year and are updated in the monthly AGRICULTURAL OUTLOOK magazine. The reports analyze supply, demand, price, and outlook for cotton and wool, dairy products, fats and oils, feed, fertilizer, fruits, livestock and meat, poultry and eggs, rice, sugar and sweeteners, tobacco, vegetables, and wheat.

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The 1979 CROP REPORTING BOARD CATALOG, outlining reports of estimates on production, stocks, and prices of commodities and the release dates of the reports, is available free from the ESCS Crop Reporting Board, Room 0005-South, USDA, Washinging, D.C. 20250.

FARMERS' NEWSLETTERS, designed to help farmers make production and marketing decisions, are issued free at critical times during a crop year for oilseeds, cotton, wheat, livestock, and feed. A general category also is included. To subscribe, send your name and address to ESCS Information, indicating which newsletter (by crop) you wish to receive.

Farmers, businesses, and others who need information can obtain it quickly through a COMPUTER REPORTING SERVICE network. This automated system offers summaries of situation reports, crop and livestock estimates from the Crop Reporting Board, and agricultural supply and demand estimates. Access is through the user's own terminal; there is a charge for computer time. For more information about this service, contact the Secretary of the Crop Reporting Board, Room 0233-South, USDA, Washington, D.C. 20250.

The FARMERS' NEWSLINE report, featuring 60 seconds of the latest crop, livestock, and farm economic information, is changed each weekday at 4 p.m., Washington, D.C. time. Call toll free (800) 424-7964 (not available to Washington, D.C. callers).

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